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AVIATION

October 1, 1958

15 CENTS

REFERENCE COPY



UNSURPASSED IS THE WORD. The word used most often to describe the single-engine performance of the Fairchild F-27 propjetliner is "unsurpassed." Others are "finest," "superb," "best." Whatever the adjective, the F-27's rate of climb on one engine is unsurpassed at sea level, 5,000 feet or higher. For example, this take-off with one prop feathered was made from the 6,200-foot Colorado Springs, Colo., airport in 85-degree ground temperature at maximum gross take-off weight. The word for it is "unsurpassed." The first American turbine-powered transport certificated and the first in airline service, the F-27 also is first in the excellence of its performance. FAIRCHILD ENGINE AND AIRPLANE CORPORATION,



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Inept Decision

The President's veto of S.3502 to amend and extend the Federal Airport Act has stirred up feelings from coast to coast. Rarely has a White House action on any aviation matter resulted in such a ruckus. Politically, the veto was an error.

But we don't believe the President should approve or reject Congressional action simply for political reasons. What really disturbs us is that the White House accepted verbatim the antiquated and distorted views of the Department of Commerce concerning the role of airports in the national transportation picture.

The President's veto memorandum is based on the fallacious premise that civil airports "have always been regarded as primarily a local responsibility." This is bunkum, pure and simple. The federal government has from the very start of the Republic actively aided all national forms of transportation—in the national interest. Every airport served by a scheduled carrier, regardless of the usefulness of other airports, is an integral part of the national transportation system—some 550 of them.

Without any doubt, the White House will be rebuffed by the next Congress. Both houses voted overwhelmingly in favor of federal matching aid. In the meantime, a lot of programming will be held up. Full credit for the veto can go directly to the Department of Commerce, which hasn't had a constructive and progressive thing to say on behalf of civil aviation in some years.

Watch the Highways

Only thirteen years ago, in 1945, the railroads carried 30.6% of all intercity passenger traffic in the U.S. The airlines carried a puny 1.1%.

Eleven years later, in 1956, the railroads were down to 4.1% and still sliding, while the airlines had increased to 3.6%.

An Interstate Commerce Commission examiner has predicted that, if the present trend continues, there will be no more railroad coach service remaining in the United States by 1970, except for commuter service. The long, expansive era of railroad passenger service is nearing an end.

It is the automobile that has become the real victor in the intercity passenger transportation competition. It is estimated that 88% of all intercity traffic is by car—an overwhelming percentage.

A vast expansion of interstate highways is just getting under way. Road improvements are in progress everywhere. The net effect of highway expansion needs to be weighed carefully by the airline industry, especially for local services. The automobile, with its infinite flexibility, is an effective competitor which can be met only on grounds of speed, economy and convenience. The natural ally of the airlines is, of course, the car rental operators such as Hertz, Avis and National.

The private and business airplane have flexibility similar to that of the automobile and will garner an ever-increasing share of intercity traffic.

Long-haul air transportation will continue to increase steadily, but there is good reason to believe, even now, that improved highways have taken away some traffic from short-haul airline routes even in this early stage of air development.

The airlines have for too long anchored their ticketing services closely to downtown locations. The entire procedure of obtaining space, picking up a ticket, getting delivered to the airport, and being processed for boarding, needs to be simplified. It is easy to hop into one's own car, fill up the gas tank and barrel down a highway directly to a destination. In the decline of railroad passenger traffic, credit to the airlines should not outshine the extremely effective role of the automobile. Only a relatively small percentage of total non-commuting railroad traffic switched to air. The bulk went to the highways.

It was the highway that hurt the railroads most. It is the highway that is the real competitor of the airlines. We seriously doubt that sufficient study has been given to the singularly important fact that the airlines have not by any means fully supplanted the rails. The highways grabbed the major share.

Lockheed's Justified Boast

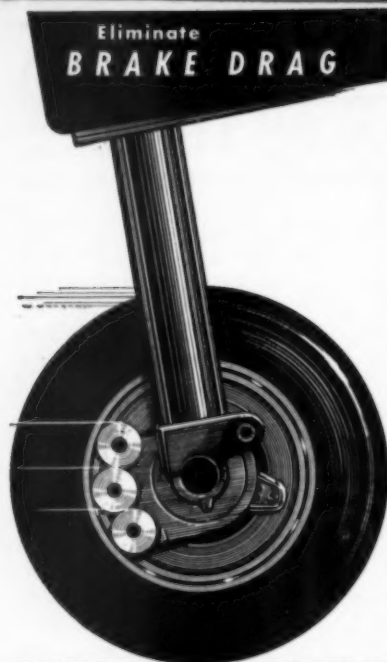
With well-earned pride, Lockheed Aircraft Corporation is taking space in national magazines in a highly effective series of right-hand pages to tell the world that for the first time in modern history all three major world records are held by the planes of one company.

The distance record of 11,236 miles from Australia to Ohio was set in 1946 by a Navy P2V Neptune and has remained unbeaten for twelve years. The altitude record of 91,249 feet and the speed record of 1,404 miles per hour were both set by the USAF F-104 Starfighter. Fame, indeed.

But Lockheed has even more to be boastful about. The reports of the new Electra turboprop transport are increasingly glowing. The Electra seems destined to be one of the finest U.S. entries in commercial transport in history. Somewhat overshadowed by the Boeing, Douglas and Convair turbojets which will set new long-range records, the Electra is not likely to take a back seat in public attention for long. Our forecast is that the Electra will be a major click with world-wide following and a long period of usefulness on the airways of many countries.

And added to all this is a book just issued by Lockheed entitled "Of Men and Stars," a collection of previously issued articles delineating the first twenty-five years of the company's history. This is a book to prize. The writing and pictorial presentation are excellent. It is in a very large measure a history of U.S. aviation all by itself.

Wayne W. Paul



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LETTERS

The \$660-Million Answer

The answer to "The \$660-Million Question" (A/A August 25, p. 19) appears to be as clear cut and simple as the comprehensive and intelligent manner in which you laid the problem before your readers.

To begin with, foreign carriers with dollar credit and in the soft currency category cannot absorb a goodly quantity of piston-powered aircraft. Nor can local service or supplemental carriers.

At the outset, the best solution does seem to lie within certain Federal agencies, but then they too are strapped with the same problems of collection and payment except for the moderate guarantees they could latch onto from mail pay subsidies.

I believe that Convair, Lockheed, Douglas, Boeing and others could and should finance this entire project of reallocation of piston-powered aircraft. For example, Convair, who is a bit low on its advance sales of "880" jets could purchase or guarantee payment of DC-7, 1049 and DC-6 aircraft to major airlines desiring 880's, then in turn, Convair could make lease-purchase arrangements for three, six and ten year periods on a \$20,000-\$30,000 per month dry lease basis.

This would not only insure sales to major and financially capable minor airlines of jet or propjet aircraft but would give the soft currency countries a reasonable opportunity to pay for and use these ships. Hand in hand, this would satisfy the U.S. government agencies who would undoubtedly assist the prime manufacturers whom they have already financed on their military programs in numerous ways.

Robert O'Brien, President
Croydon Pacific Corp.
Burbank, Calif.

More Words on a Word

I am in agreement with Mr. J. H. Pratt of Woodland Hills, Calif. on the use of the word "propjet" (A/A, July 28, p. 12).

However, I received a bit of a shock when I consulted my copy of *Baughman's Aviation Dictionary and Reference Guide*, third edition, 1951 as published by Aero Publisher's, Inc. of Los Angeles, Calif.

In the New Definitions chapter on page 311 is the word "propjet" and the following definition:

"A variation of the turbojet consisting of a combination powerplant using the power generated by a gas turbine to rotate a conventional propeller. At the same time, the basic jet engine of

this combination provides thrust by exhausting its hot gases to the rear."

Under the word "turboprop" on page 333 is the notation "See PROPJET".

In looking through the definitions I also find the words "pulsejet," "thermojet," and "turbojet." This seems to indicate that, either we are incorrect, or that there is disagreement among authorities as to what terms are correct.

"Propjet" conveys to me a strong suggestion of a composite powerplant. According to this dictionary, however, I am off the track.

Perhaps it would be well to find out if there is a single accepted authority on things of this type. You could then follow their recommendations in your publications and plead for acceptance by all concerned.

Certainly a standard terminology would avoid much confusion. In view of the rapidity of new discoveries and advancements in so many fields today it is important that we all understand the exact meaning of a term.

N. M. Kane
624 Karluk St.
Anchorage, Alaska

Sets Not Seats

We appreciate the reporting of our success in securing the Trans World Airlines Boeing 707 seat contract (A/A Sept. 8, p. 20). However, there is an error in the quantity of seats; wherein you state, "TWA's order for 33 passenger seats." This should have read, "For 33 airplane ship sets of seats" or a total of 3,337 passenger places—undoubtedly the largest single order for passenger seating ever to be placed by one airline for a single fleet of airplanes.

Also, we would like to add that Teco has been awarded a contract for the seating requirements of Bonanza Airlines fleet of Fairchild F-27 airplanes.

Ellis L. Clark
Sales Manager
Teco Inc.
Burbank, Calif.

AMERICAN AVIATION offers these columns to readers for expression of opinion and criticism on the editorial content of this magazine and/or happenings in the aviation industry. Address such correspondence to Joseph S. Murphy, Executive Editor, American Aviation, 1001 Vermont Ave., Washington 5, D.C. Anonymous letters will not be printed; however, names will be withheld on request.

Old Controversy

I would like to call your attention to the fact that on Page 27 of the July 28 issue you show a picture entitled "Small War"—Boeing Airplane never made the KB-50.

The KB-50 is a modification of the Boeing B-50 and is manufactured by Hayes in Birmingham, Ala. I feel that a correction should be made giving Hayes their just recognition for an engineering feat that by some industry observers was deemed not only impractical but impossible.

Name Withheld by Request

EDITOR'S NOTE: Not a new problem but one that hasn't been solved. From here out we will call it the Boeing/Hayes KB-50.

Two Instead of One

The Aircraft Data Card covering the McDonnell F4H-1 (AMERICAN AVIATION, Aug. 25) was in error. Listed as a "single-place, single-engine all-weather jet interceptor," this should have read "two-place, twin-engine . . . interceptor."

When & Where

OCTOBER

Champion Spark Plug Co.'s annual aviation spark plug and ignition conference, Secor Hotel, Toledo, Oct. 8-10.
Armour Research Foundation and Illinois Institute of Technology annual noise abatement symposium, Hotel Sherman, Chicago, Oct. 9-10.
Air Mail Pioneers 40th anniversary Ball, Beverly Hilton Hotel, Beverly Hills, Calif., Oct. 10.
Annual New York State airport development and operations conference, Onondaga Hotel, Syracuse, N.Y., Oct. 14.
Annual Indiana aviation conference, Turkey Run State Park, Ind., Oct. 15-17.
Southeastern Airport Managers Assn., annual meeting, Palm Beach, Fla., Oct. 15-17.
Institute of Radio Engineers national Aero-com symposium, Utica, N.Y., Oct. 20-21.
Annual symposium on aviation medicine, Miramar Hotel, Santa Monica, Calif., Oct. 22-24.
International sports car and light plane exhibition, International Amphitheater, Chicago, Oct. 24-Nov. 2.
International Air Transport Assn., annual general meeting, New Delhi, Oct. 27.
Institute of Radio Engineers East Coast aeronautical and navigational electronics conference, Lord Baltimore Hotel and 7th Regiment Armory, Baltimore, Oct. 27-29.
Air Traffic Control Assn., annual business and council meeting, Washington, D.C., Oct. 29-31.

NOVEMBER

Association of Local and Territorial Airlines, quarterly regional meeting, Honolulu, T.H., Nov. 6-7.
Institute of Aeronautical Sciences, national specialists meeting on dynamics and aeroelasticity, Fort Worth, Tex., Nov. 6-7.
National Defense Transportation Assn. annual general convention and logistics forum, St. Louis, Nov. 9-12.
School of Aviation Medicine, international conference, San Antonio, Tex., Nov. 10-12.
Flight Safety Foundation, annual international air safety seminar, in cooperation with Airway Modernization Board, Atlantic City, N.J., Nov. 10-13.
Aircraft Industries Assn., board of governors annual meeting, Phoenix, Ariz., Nov. 16-18.
American Society for Quality Control, annual aircraft and missile division conference, Baltimore Hotel, Dayton, O., Nov. 17-18.
Aviation Distributors and Manufacturers Assn., meeting, Dallas, Tex., Nov. 18-20.

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BOOKS

An Absorbing Autobiography

Come North With Me. By Bernt Balchen. Published by E. P. Dutton & Co., New York. 318 pp., illustrated. Price, \$5.

Here is an airman's autobiography that can go on the "must" list of every public and private library. It is absorbing reading. Col. Balchen retired from USAF last year. His Far North exploits and contributions from World War II on are fairly well-known, but his career becomes almost legendary when his experiences of early aviation days are taken into account. Familiar aviation names of several decades ago, such as Tony Fokker, Lincoln Ellsworth, Clarence Chamberlain and many others, make the text unusually interesting to those who were in early aviation. An important book. W.W.P.

Flight Navigation Study

The American Flight Navigator. By John Dohm. Published by Pan American Navigation Service, Inc., North Hollywood, Calif. 352 pp. Price, \$6.50.

A comprehensive and clearly presented study of the methods and equipment used in international transport navigation from dead reckoning to Doppler and Navarho. The author, editor of *The Journal of the Institute of Navigation* and a former airline flight navigator, also has included a written navigation and working material designed to prepare students for CAA's flight navigator certificate.

Aircraft Reference Guide

United States Civil & Military Aircraft for 1958. Compiled and edited by the publishers, The Robert R. Longo Co., Inc., Wichita, Kans. 230 pp. Price, \$2.95.

A complete reference book containing specifications and photos of all U.S. military and civil aircraft produced in 1958. Also included are foreign-built aircraft registered in the U.S.

British Aviation Directory

"The Aeroplane" Directory of British Aviation, 1958 Edition. Temple Press Ltd., Bowling Green Lane, London, E.C.1. 613 pp. Price, 30 shillings (\$4.20).

Compiled by the staff of *The Aeroplane* magazine, this is a valuable reference book for anyone interested in aviation in the British Commonwealth, including its air forces, ministries, organizations, airlines, industries, flying clubs and airports. It incorporates

Who's Who in British Aviation, containing more than 1,500 listings.

The section devoted to aircraft and engine manufacturers has been enlarged to include particulars of numerous guided weapons departments.

Jets and Rockets

The Complete Book of Jets and Rockets. By D. N. Ahnstrom. The World Publishing Co., Cleveland and New York. 160 pages. Price, \$4.95.

The author, an aviation writer and editor for the past 15 years, deals with the highlights of the evolution of jet and rocket engines and aircraft from the year 120 B.C. through today's rocket planes and missiles.

The book, written for young and old, contains details of jet engine theory and operation. Problems of high-speed flight, jet age protection for pilots, in-flight refueling and carrier operations are included along with tables detailing performance of many U.S. and foreign engines and aircraft.

Personal History of An Ace

Thunderbolt! By Robert S. Johnson, with Martin Caidin. Published by Rinehart & Co., Inc., New York. 305 pp. Price, \$3.95.

Intensely dramatic is this story of one of America's leading aces of World War II, Robert S. Johnson, who shot down 28 German fighters in less than a year of combat. With the aid of Martin Caidin, he has produced a highly entertaining personal narrative. It's also a testimonial to the fighting characteristics of the Republic P-47 Thunderbolt.

World War III

War—1974. By Lt. Col. Robert B. Rigg. Published by The Military Service Publishing Co., Harrisburg, Pa. 264 pp., illustrated. Price, \$5.

In describing "World War III," Rigg's book is both shocking and fascinating. It cannot be called science fiction, because the author, with each future weapon he describes, supplies a footnote indicating the corresponding hardware presently in development. From the first ICBM, which makes Chicago a crater, until the final mopping up of Eurasian Communist troops, the book is thoroughly convincing.

Rigg gives imaginative predictions of future military concepts and equipment, including the individual soldier's uniform, a needle rifle, an aerial motorcycle, strategic missiles, electronic spies and war-plans of the Allied forces. It all has a kind of deadly fascination.

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CJ-805 RECEIVES OFFICIAL CAA CERTIFICATION

On Sept. 9, General Electric's CJ-805 received its CAA type certification . . . important milestone in its intensive test program. General Electric's goal in this program: to provide airlines with a reliable, dependable, high-performance jet engine for commercial operation.

Here are highlights of the CJ-805 test program:

ENDURANCE TESTS PROVE A MATURE ENGINE

CJ-805 factory tests are proving the reliability of all engine parts, components, and accessories. Progress to date: first endurance engine has now logged almost 2000 hours; second engine more than 1000 hours on kerosene. A total of 9 engines are now engaged in factory and flight testing.

The endurance engines are run to simulated airline schedules, approximating conditions of successive 1-hour, 1½-hour, and 2-hour commercial flights. Conditions include taxi, take-off, climb, cruise, descent, reverse thrust and taxi regimes—a total of over 600 engine starts and stops for every 1000-hour period.

NO PARTS CHANGE DURING INITIAL FLIGHT TEST

During initial flight tests, a prototype CJ-805 engine logged a total of 150 hours in 25 working days without a parts change or engine adjustment. Included in the flight tests: throttle bursts and chops at altitudes up to 45,000 feet, plus air starts at various altitudes. Flight tests of the production CJ-805 are now underway.

160% OVERSPEED; 75° OVERTEMPERATURE

CJ-805 components are being tested above normal requirements. The compressor rotor, for example, has been tested to 135% speed; the turbine rotor to 160% speed and 75° over-temperature.

HAILSTORM TESTS DEMONSTRATE CJ-805 RUGGEDNESS, DURABILITY

The CJ-805 has been tested under severe hailstorm conditions. One and one quarter-inch iceballs were fired into a running CJ-805 at iceball speeds from zero to 637 miles per hour with no effect to engine operation. Power settings included maximum rpm. With two-inch iceballs, the engine took hits up to 378 mph without damage. These tests were



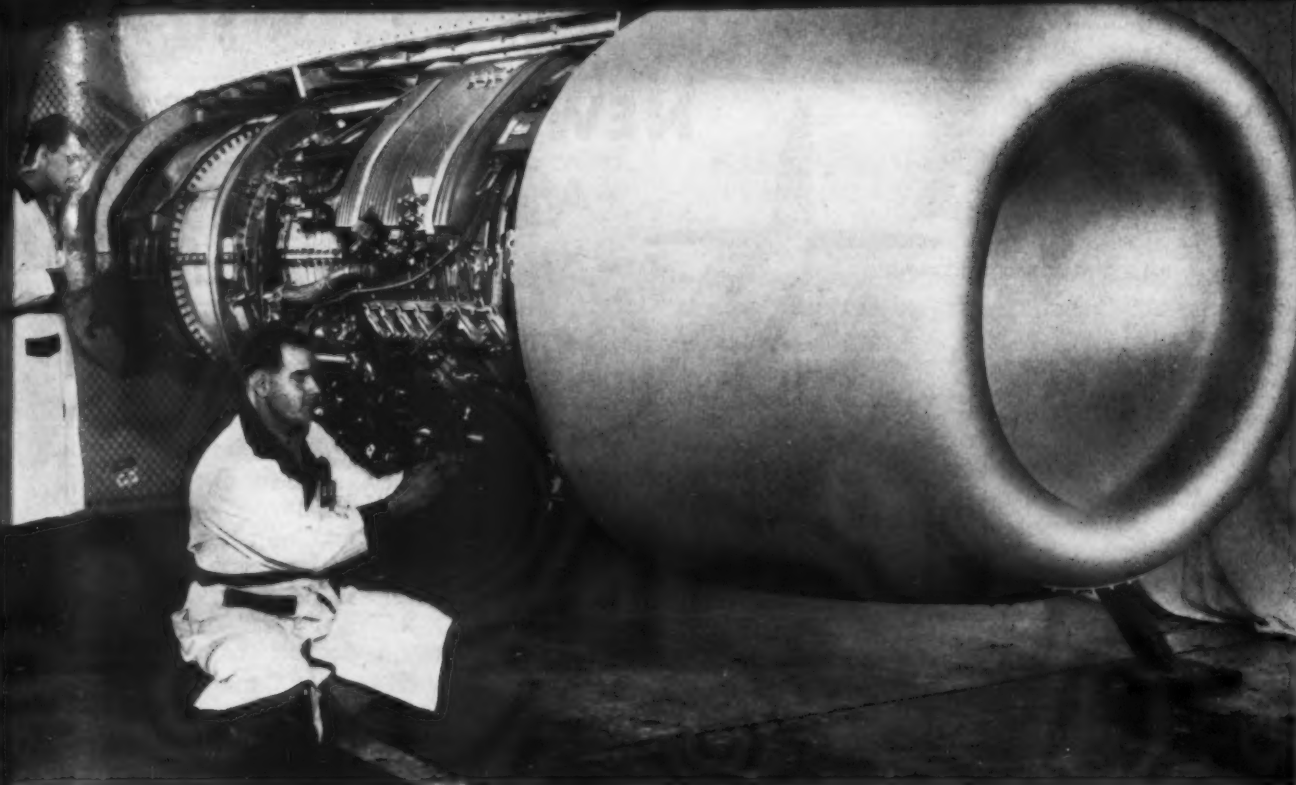
AMERICAN AIRLINES has announced the purchase of 25 Conair 600's, powered by new General Electric CJ-805 aft-fan engines. Other models of the CJ-805 will power TWA and Delta Air Lines' Conair 880's.

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conducted at speeds 28% in excess of requirements.

CJ-805 REVERSER AND SUPPRESSOR TESTS SUCCESSFUL

A CJ-805 mounted in a Convair 880 wing pod is testing G.E.'s Reverser Model TR-22 at General Electric's outdoor test facility. A prototype reverser has already completed 500 reversals.

Acoustical and performance tests of the shrouded daisy ejector suppressor are proving successful. The ejector daisy provides excellent nozzle efficiency at a wide range of power settings, promising minimum loss in altitude performance.

The new aft-fan CJ-805, scheduled to power American Airlines' Convair

600's, has also been run outdoors for sound level measurements. Results so far indicate the aft-fan principle is helpful in reducing engine noise.

WHAT THESE CJ-805 TESTS MEAN TO AIRLINES

When the CJ-805's enter service, they will join more than 30,000 other G-E turbojets built for the Armed Services. These engines have already—

today—logged more than 22,000,000 flight hours and 10 billion flight miles.

General Electric's CJ-805 test program is one more assurance that airlines, like the Armed Services, will get ruggedness . . . reliability . . . dependability . . . and economy when the new CJ-805 begins flying the nation's commercial airways in 1960. General Electric Co., Cincinnati 15, Ohio.

237-24

Progress Is Our Most Important Product

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FIRST PRODUCTION MODEL OF CJ-805 was delivered to Convair last month. Military version of the CJ-805 (the J79) recently powered the Lockheed F-104 to new world altitude and speed records.



CJ-805 SOUND SUPPRESSOR AND THRUST REVERSER TESTS are currently being conducted at General Electric's Peebles, Ohio, test facility.

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CONVAIR

240

CONVAIR

340

METROPOLITAN

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540

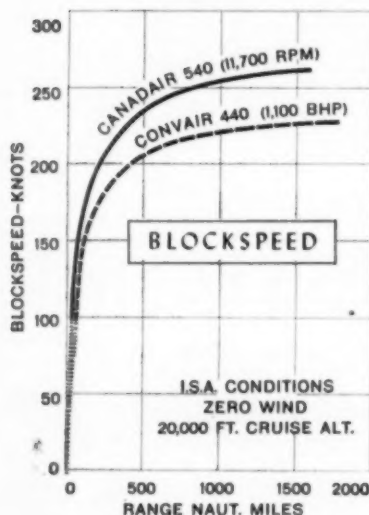
TURBO-PROP

For short-to-medium routes

the
NEW CHALLENGER

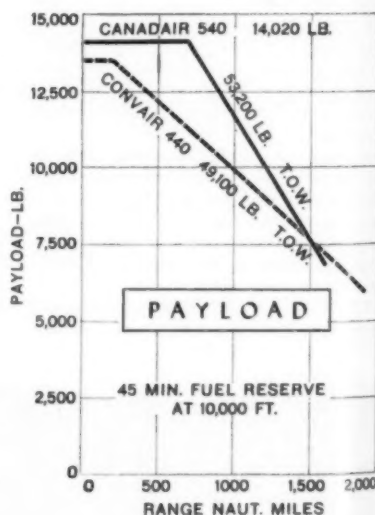
-Ahead in Blockspeed

-Ahead in Payload



Graph at left shows the significant improvement in speed available in the turbine-powered "540" compared with the "440"—as much as 34 knots at a range of 1000 nautical miles.

Graph at right shows that the earning potential of the "540" is greatly increased. It is capable of carrying 48 passengers, plus their baggage, plus 4210 lbs. of cargo (total payload: 14,020 lbs.) a distance of 680 nautical miles. This represents a payload increase of 365 lbs. over the "440", and a range increase of 500 nautical miles.



Furthermore, with its Napier Eland turbine power, the "540" max gross weight is increased 4100 lbs. over the "440" (up to 53,200 lbs.)... and the "540" can reach cruising altitude of 20,000 ft. in half the time (15½ mins. vs. 35 mins.). The "540" builds on the well-known and excellent record of the "440", and is altogether a new airliner unsurpassed in performance characteristics and earning power.

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AMERICAN AVIATION

AIRTRENDS

Knockout battle can be expected soon over some parts of the Stever Committee report on reorganization of the Air Force's research and development effort. Big fight will come over whether ARDC ought to be given complete control over all R&D funds or whether a large part of the R&D effort should continue to be funded out of procurement and production money.

Navy evaluation of the North American A3J Vigilante attack fighter is expected to get under way sometime in December. In the meantime, Naval Air Test Center is looking forward to possible side-by-side evaluation of the McDonnell F4H and Chance Vought F8U-3, if a decision on the two has not been reached before second phase testing starts after the first of the year. Both are in preliminary evaluation at present as Navy's next generation of carrier interceptors.

Air Force will continue to operate procurement under weapon systems management concept. New study recently completed indicates that, despite reports to the contrary, B-58 costs compare favorably with those of other aircraft. Explanation is that, under other methods of contracting, all costs don't show in a single account and are sometimes hard to allocate, while under the systems management concept all costs show up clearly.

Economic considerations will increasingly force the Air Force to eliminate work on more than a single aircraft engine, or major subsystem, with limited amounts of competition only at design-concept level. Choice of contractors more frequently will be based on past performance and the availability of facilities.

Air Force will intensify its nuclear-powered aircraft program as a possible follow-on to bridge any technological gap that may follow the B-70/F-108.

General Electric has a reactor working that is being tested with a modified J47 engine. Chief difficulty is that engine-reactor combination is "monster" in size and would create major problems in development of the airframe.

Nevertheless, planners would like to build two prototypes. Rewards would be very great, they say. Atomic aircraft would obviate reliance on electronic warning systems, for example. And they could be used on almost indefinite surveillance runs. As one officer put it, "You'd have to recrew rather than refuel."

Three concepts of an early-warning aircraft are under study by USAF. One is a Boeing proposal, using the pure jet. Another is from Lockheed, presumably using turboprops. The third is a joint undertaking of Convair and Canadair, with the big Canadair turboprop CL-44 as its platform. These aircraft would be used to supplement radar lines in the North. Main requirements, therefore, are long range and endurance. Decision is expected in few weeks.

"Aerospace vehicles" is the expression being used by AF officers to describe aircraft of the future. Flying within the atmosphere, they'll have all the characteristics of aircraft. Beyond that region they will become space ships. Dreamy stuff now, but don't be too surprised when it happens. Nevertheless, bombers carrying an air-to-surface ballistic missile are here to stay for awhile, and transports are a necessity. Even most space-minded officers are willing to concede these facts.

Double-barreled question of how many more B-52Gs and B-58s will be programmed hinges partially on successful development of new air-launched ballistic missile as successor to Hound Dog. Air Force Secretary James H. Douglas, speaking at Air Force Association convention in Dallas, said use of such a missile on an aircraft would provide the most mobile ballistic weapon platform ever conceived. At the same time, crew lives would be saved by the ability to "stand off" about 400 miles and launch such a missile from the aircraft. This type of armament is definitely planned for the B-70. Speed of development of the chemical bomber also bears heavily on just how many more B-52Gs and B-58s will be programmed. As another Air Force official said recently, "We don't win wars with paper bombers."

AIRTRENDS

A hot new competition appears to be shaping up for U.S. aircraft manufacturers with Royal Canadian Air Force starting to look around for a replacement of its Orenda 14-powered Sabre 6s. Best bets at present are the Grumman F-11F-1F, Lockheed F-104, Republic F-105 and the Northrop N-156. As many as 300 aircraft may be involved.

Decline in aircraft and parts industry employment ended just before fiscal 1959 started July 1. Bureau of Labor Statistics reports the downward trend ended in May and that, by the end of June, the trend was definitely upward. May was lowest employment total—742,800—since 1955. But average weekly earnings continued to rise, with a new peacetime high of \$103.22 last June. That figures out to a \$2.78 per week increase over May.

Battle of propellers for use on turboprop aircraft continues, with a new evaluation due. Fighting for a place in the sun are: Curtiss-Wright; Aeroproducts Division of General Motors, whose three-bladed props are used on the Lockheed C-130A Hercules, and Hamilton Standard, whose four-bladed props are used on the C-130B.

More extensive subcontracting is almost a certainty. For such planes as the F-108 and B-70, not only the production but the engineering of the wing structure will be subcontracted. The idea is that it helps hold together know-how and a needed mobilization base, and simultaneously speeds development.

Despite the lack of orders, there still is a lot of real interest within Navy—and the Army—in Sikorsky's turbine-powered S-62. Navy primarily is looking for a copter with good in-water characteristics, which the S-62 appears to have. Meanwhile, Sikorsky is at work on the S-60 flying crane, which eventually is expected to get turbine power but will start with a pair of P&W R2800s.

Pratt & Whitney may complete its 50-hour CAA certification test for the JT12 ahead of either General Electric's J85 or Fairchild's J83. Informal test is already com-

pleted and the company is now prepared to offer production engines for delivery next year. Present thrust to weight ratio is better than 6:1. Company expects to improve the ratio substantially in production models.

Northrop Aircraft is hopeful of substantial contract for the T-38 advanced trainer now that the plane's J85 engines have been received for ground test. First flight is expected early in December if engine check-outs are satisfactory. Second of the eight-plane order has rolled off the production lines.

License agreement between Bristol and Curtiss-Wright on the TJ37 engine project has been canceled by mutual agreement. The Bristol Company, as a result, again holds complete marketing control but may undertake negotiations for license production with an engine manufacturer in the U.S. or Canada. Bristol powerplant is still a strong contender for a share of the Lockheed JetStar market if and when the small utility jet goes into production.

Smoke from water injected into jet engines during takeoff is in for further study by engine manufacturers. The topic of much discussion at the Monte Carlo International Air Transport Association meeting, the trouble is caused by the quenching effect of water on particles of incandescent carbon, and may create traffic control problems during heavy traffic operations in certain weather conditions.

Newest design development in the Lockheed JetStar calls for dual nose and main landing gear wheels. Feature is intended to overcome concern of some potential customers regarding need for highly stressed runways, particularly in view of JetStars increase in gross weight up to about 38,000 lbs.

Beryllium research at present is headed in at least two different directions—for structural applications in high-speed aircraft and as a solid propellant. One company, Beryllium Corp., recently received an Air Force R&D contract to investigate possibilities of producing castings of beryllium.

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Esso is clearly the leader. Airlines know that quality saves them money in the long run. Esso Aviation Oils are backed by intensive research, comprehensive service tests and millions of hours of actual use in commercial air transports. In reciprocating engines, Esso oils prevent piston ring sticking and lessen the formation of sludge and other harmful engine deposits. With an unusually high viscosity index, Esso Aviation Oils maintain fluidity at low temperatures yet provide a tough shield when hot. Esso oils can be relied upon to reduce wear of cylinders, bearings and other critical engine parts.

In aviation turbine oils, the synthetic EATO 35, perfected by Esso in 1949, is still the only oil approved for the world's most advanced turbine airliners.

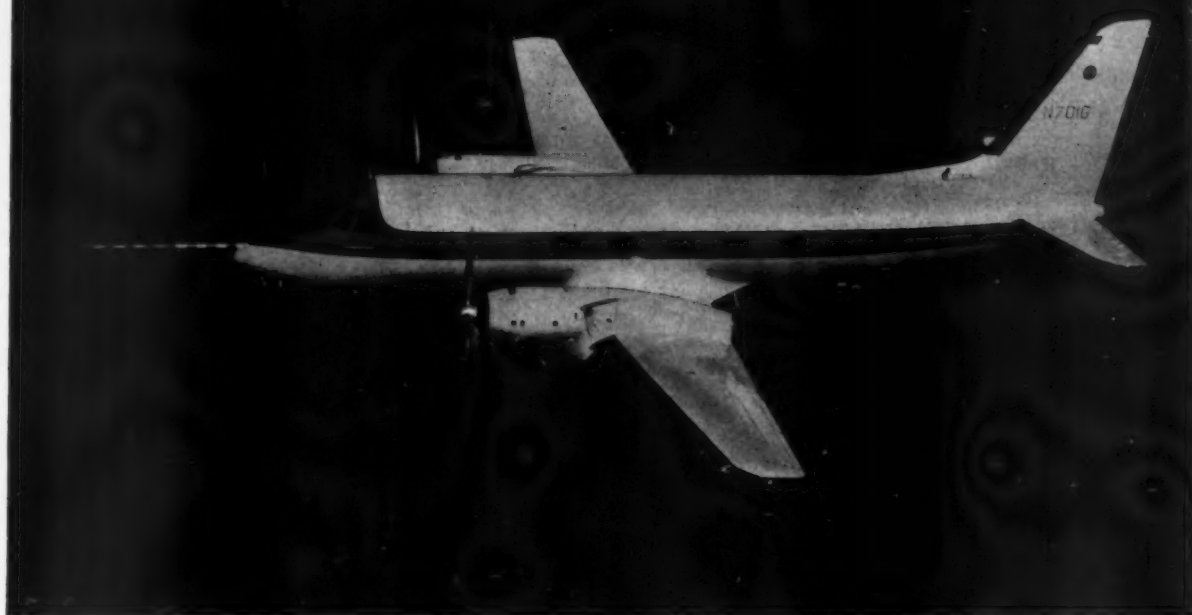
Both types of oil reduce maintenance costs while increasing the time between overhauls.



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OCTOBER 6, 1958

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B. F. Goodrich Pneumatic De-Icers are flush mounted on Grumman Gulfstream

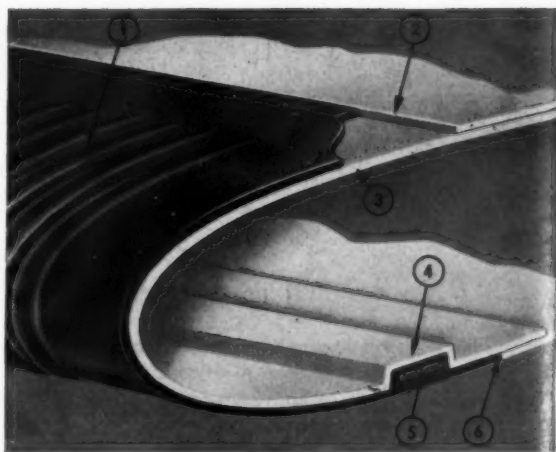
Here are three basic reasons why Grumman engineers selected B.F. Goodrich Pneumatic De-Icers for their new turbo-prop executive transport—the Gulfstream.

First—B.F. Goodrich Pneumatic De-Icers are the most dependable and effective method of ice removal. Their positive action cracks off ice regardless of accretion rate. And with this pneumatic de-icing system there is no problem of "refreezing run back".

Second—B.F. Goodrich Pneumatic De-Icers impose no heavy drain on engine power or fuel consumption. Power requirements are negligible. Furthermore, the complete system is far lighter in weight than any other.

Third—B.F. Goodrich Pneumatic De-Icers are aerodynamically efficient. Advanced Gulfstream design provides for recessed leading edges (right), permitting flush fit of De-Icers with no change in airfoil contour.

There are many other reasons why you will want to specify B.F. Goodrich Pneumatic De-Icers for your own planes. They are all discussed in "The B.F. Goodrich Pneumatic De-Icer Story". For your free copy, write: *B.F. Goodrich Aviation Products, a division of The B.F. Goodrich Company, Akron, Ohio.*



① De-Icer, inflated ② Wing recess at trailing edge of De-Icer
③ Wing skin ④ Wing recess for De-Icer manifold ⑤ Flush-type tube manifold ⑥ Wing recess at lower trailing edge

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AMERICAN AVIATION

AMERICAN AVIATION

OCTOBER 6, 1958—VOL. 22, NO. 10

WORLD'S LARGEST AVIATION PUBLISHERS

What costs will the Defense Department allow a contractor to charge on a cost-type contract? Are the same costs allowable when the government terminates a contract for its own convenience? What costs are allowable when a contractor and a government

contracting officer recalculate prices under price-revision type contracts?

These and other questions have been plaguing contractors and the Army, Navy and Air Force at least since 1954.

Toward universal contract cost principles . . .

The Pentagon Tries... and Tries Again

By Betty Oswald
Defense Editor

The Defense Department has been battling for the past four years to put on paper a comprehensive set of cost principles to apply to all types of contracts. Progress has been slow and painful. Differences still exist, not only between the Defense Department and contractors, but between the Army, Navy and Air Force.

This lack of unanimity has been further aggravated by differences between the Office of the Secretary of Defense, in some cases, and the Comptroller General of the U.S. Chief result of the conflict to date has been a series of drafts of comprehensive cost principles that ultimately will be included in Section 15 of the Armed Services Procurement Regulation. These drafts have been opposed by interested industry groups.

But now the Pentagon, in an effort to placate industry or, at least, avoid its potent opposition, is trying again. It has prepared yet another draft of cost principles that will be the subject of a meeting October 15 between Pentagon procurement officials and industry representatives.

• **Pentagon approach conciliatory**—In their latest draft of proposed cost principles to govern procurement practices, Pentagon planners have not tried to revise the entire regulation. Instead, they have merely attempted to narrow the gap between industry and government thinking in two principal areas.

1. Applicability of the regulation to various types of contracts.
2. Treatment to be accorded three categories of selected costs—compensation, overtime, research and development.

Whether there will be more changes and drafts will depend to a large extent on the meeting scheduled for October 15 and how determined the Pentagon is to produce the new rules.

The new draft attempts to make it

clear that Part 2 of the regulation will be used as:

- A contractual basis for determination of reimbursable costs under cost-reimbursement contracts.

- Terminations.

- A basis for development and submission of cost data and price analyses by contractors and would-be contractors. As such, these data and price analyses would support negotiated pricing, repricing and overhead rates; requests for progress payments and settlement proposals under termination.

- Audit reports.

- By contracting officers in the evaluation of cost data on retrospective pricing and settlements.

- In forward pricing.

- For determining the acceptability of specific costs.

- **Industry skepticism remains**—That the new draft will meet the industry's serious objections is difficult to believe.

A spokesman for the Aircraft Industries Association, commenting on an earlier draft of Pentagon cost principles, said:

"The Department of Defense's proposed approach to a set of cost principles as evidenced by the current draft thereof would, in its final effect, result in the application of contract cost principles to fixed-price contracts on very much the same basis as cost-reimbursement type contracts. It is our opinion that such a requirement would not only destroy the fixed-price concept of contracting, but would also impose arbitrary and burdensome administrative controls upon industry which would seriously impair management responsibility, authority, flexibility and incentive. . . ."

To meet the industry objection, that the principles as written would bar the allowance of some normal items of cost of conducting business, DOD has rewritten the rules to provide that where "reasonableness or allocability" are difficult to determine, an advanced agree-

ment should be worked out with the Government.

Items involved would include: personal service compensation; use charges for fully depreciated assets; food and dormitory service furnished to employees without cost; deferred maintenance costs; pre-contract costs; research and development costs; royalties; selling and distribution costs; travel costs. Industry may argue that any advanced agreement with respect to these costs is "unrealistic" since it's frequently impossible to determine in advance how much some of these costs will be.

- **Areas of disagreement**—As to the three specific items of costs affected by the new draft, there is likely to be no argument over the handling of overtime. However, there will in all probability be a bitter dispute over the handling of R&D costs.

Describing an earlier draft, AIA said: "It is the opinion of this industry that all independent research is a part of overhead and should not be singled out for special treatment. It is subject, along with all other expenses making up overhead, to the test of reasonableness and allocability on an after-the-fact basis."

DOD met this objection in a limited sense only. The new draft now provides that independent applied research and development may be allocated to appropriate, sponsored applied research and development contracts only in those cases where the contractor normally does no production work.

Finally, the revision deals with personal compensation. Here, the reaction seems to be that the Pentagon gave a little ground. The revision allows compensation incentives to management provided that the total compensation paid is reasonable.

DOD said recently it hoped to issue the comprehensive cost principles soon. However, it is likely that there will be at least one more draft of the rules—if it still wants to win industry support.

USAF Stalls Utility Jet Progress

- Indecision threatens U.S. position in world market
- Delay may mean millions of dollars in lost sales
- Only decisive action will avert irrevocable damage

By Joseph S. Murphy
Executive Editor

This is the dismal outlook facing what should be the U.S. aviation industry's most promising production program for the next five to 10 years.

And what began as a much-heralded Air Force "off-the-shelf" utility jet competition a full 26 months ago not only hasn't gotten off the shelf, but is pigeon-holed and gathering dust somewhere in top-level USAF offices in the Pentagon.

This despite the fact that one contender (Lockheed's JetStar) has been flying for 13 months and another (North American's Sabreliner) made its first flight last month. A third (McDonnell's Model 119) is well on its way through prototype fabrication and is expected to fly sometime next spring.

Although USAF has been silent on its handling of the program, there are strong indications that it will make no move until all three aircraft are flying and tested. In the ensuing six months, however, a production go-ahead by all three manufacturers will be stalled, bringing further delay in an already overdue program.

Were the USAF utility trainer and transport market the only ones at stake, few would take issue with the "wait and see" attitude assumed by Air Force officials. But this is not the case.

Far to the contrary, the "utility jet" fever has spread fast, is now luring foreign competitive projects onto the drawing board. Further USAF delay could spur them into early production.

And meanwhile, a most lucrative but increasingly impatient U.S. and worldwide market is being frustrated by the inability of the three manufacturers to quote firm delivery dates.

A number of foreign military governments want to place orders immediately but can be given only vague promises in terms of "so many months after production go-ahead."

• State Department's strange predicament—U.S. State Department is interested. Its overseas air missions are still saddled with 20-year-old DC-3s as the showcase of U.S. air supremacy in an atmosphere of mounting "prestige warfare" with Soviet Russia. Further complicating State Department's position, some nations that want to buy U.S.

utility jets are being given transports more modern than the DC-3.

A bustling U.S. executive transport industry is chafing at the bit to buy the speedy, attractive small jets. Corporations want to place orders today, offer a market that could exceed ultimate military demands.

Civil Aeronautics Administration is showing increasing interest in the new breed of jets. Martin B-57s loaned it by USAF for navaid checks are crew-limited and its new Convairs will fall far short of handling the mammoth airways inspection chore facing CAA over the next five years.

• Defense needs hamstring—Within USAF itself, vital defense needs of a number of commands are being hamstrung by the top-level procrastination. Aircraft that should be ordered now to fill overdue roles such as navigation/bombing trainers, airways communications service, etc. are a year or more away, perhaps two.

With the millions of dollars in potential sales represented by these markets, the question USAF should find embarrassing to answer is: Why wait? This answer can't be "for proper evaluation and testing."

The Lockheed JetStar has amply proven all aspects of its performance, convinced this writer and all military officials aboard as to its safety and versatility on a recent flight from Andrews AFB, Md.

There is no design magic in the remaining shift to four small U.S. jets (instead of present twin Bristol/Wright T37s) yet an order now would make aircraft available in mid-1959 simultaneously with the replacement engines.

The same can be said for the McDonnell Model 119. Although it lacks the JetStar's flight experience, the McDonnell aircraft obviously is a good straightforward engineering effort with no taxing strains on the proverbial state of the art.

A production order now would enhance its market potential by a full year's gain in production lead-time. And there is a radical enough difference between the Lockheed and McDonnell entries (fuselage versus wing-mounted engines) to make it good business for the Air Force to underwrite orders for both models.

The price to be paid, say \$22 mil-

lion, is a paltry sum in the light of hundreds of millions of dollars in business at stake.

The NAA Sabreliner, sole flying contestant in the small UTX competition, would be far ahead of its present stage if a USAF production contract existed. It, too, has no design features that would warrant exposing it to the delays of an "X-15 type" test program.

• Limited-quantity order would help—USAF's obvious answer considered by many observers to be long overdue, is to place a limited-quantity order now for all three utility jets if only to get production under way immediately. The competitive aspects of all three models will amply demonstrate over the next few years which is the best buy and USAF in the meantime will find itself in the enviable position of being able to take its pick.

Further delay now will not necessarily allow this same decision to be made six or eight months from now. Lockheed proved beyond doubt that a "crash" program can put a small jet in the air in a matter of months and the Handley Page Hp-113 "project" (see page 26) could become a reality via the same approach. The impact of such competition obviously would be felt by U.S. manufacturers particularly in dealing with dollar-shy countries abroad.

A broader question with which Congress could tongue-tie USAF is: How can it reconcile the utility jet inertia in the face of declining aircraft production monies? The \$30-odd million it would take to get all three utility jets on the road would mean business and work potential throughout U.S. industry, extending far beyond the plants of Lockheed, McDonnell and North American.

Thus, the success of the U.S. utility jet program hangs in the balance today. USAF holds the key to this success. But how soon USAF turns the key may mean a difference of millions of dollars to the U.S. aircraft industry.

Canada Drops CF-105

Will continue R&D effort to soften blow on industry

The Canadian government, facing budget problems paralleling those that brought U.S. cancellation of such hardware as the North American Navaho and Douglas C-132, has canceled its \$2-billion program to build Avro's CF-105 supersonic jet fighter.

But as a measure of insurance in the

light of present world tensions, and to soften the blow on Canada's aviation and electronics industries, Prime Minister John Diefenbaker said development of the CF-105 and Orenda Iroquois projects would continue until March 31, 1959.

Canadian plan calls for use of the Boeing Bomarc air defense missile in lieu of the powerful CF-105 and the prime minister said he hopes to work out an agreement for license production of Bomarc in Canada.

The impact of the CF-105 cancellation, however, is not confined within the Canadian borders. In addition to many systems accessories produced by U.S. firms or their Canadian affiliates, the decision to drop the project will affect at least one major U.S. contribution to the CF-105 program.

As part of the cutback program, Canadian officials said that production of the Astra flight and fire control system developed by Radio Corp. of America and Minneapolis-Honeywell Regulator Co. also would be dropped.

Piston Failure Noted In Examination of DC-7 Engine

CAA and CAB preliminary examination of the Wright TC-18 Turbo Compound engine which burned before and after successful landing of a United Air Lines DC-7 at Washington National Airport on Sept. 21 has revealed failure of No. 2 piston. However, whether or not this was the primary cause of the near-accident will not be known until after teardown and inspection of the engine at UAL's San Francisco facility.

Shortly after takeoff, the flight engineer noted a 30-BMEP loss of power. This was followed by a drop in oil pressure from 70 to 50 psi and a rise in oil temperature to 85°C. It's understood that, when the flight engineer tried to feather the propeller, an engine overspeed to about 3,600 rpm was experienced. Eventually, by slowing the aircraft, engine speed was reduced to 1,800 rpm where it remained until after the landing.

The examination at Washington also disclosed that the engine oil system was contaminated with metal and the propeller governor was not functioning. Cause of the fire which burned through the magnesium front supercharger housing forward of the engine mounts was not immediately apparent.

Lockheed Sets Up Six-Firm Systems Management Team

A six-company "systems management team," managed by Lockheed Aircraft Corp.'s California Division, has been organized to develop a new early-warning aircraft as a follow-on to the present Air Force RC-121s and Navy WV-2s.

New aircraft, details of which are classified, has been designated CL-410 by Lockheed.

UAL Files Suit Against U.S. For Las Vegas Damages

United Air Lines has filed suit against the United States Government in Delaware U.S. District Court.

United has asked for \$3,576,698 in damages for "carelessness and neglect" in last April's Las Vegas collision between a United DC-7 and USAF F-100F in which 47 were killed (See page 28). Basing their action on the CAB ruling of CAA and USAF error in the incident, United asks \$1,980,000 for loss of the DC-7 and \$54,200 for revenue lost from the destroyed plane.

Rest of the damages covers funeral costs, travel expenses and ticket refunds for passengers and benefits paid families of the crew.

... News Briefs

• **Douglas gets \$26-million contract**—Douglas Aircraft Co. has received follow-on orders for the A3D series aircraft valued at approximately \$26 million. Design refinements and changes which improve the aircraft's performance are spelled out in the contract. Improvements result mainly from use of a cambered leading edge on the wing of the A3D-2.

• **Beech gets \$6-million subcontract**—Beech Aircraft Corp. has received a contract from Republic Aviation Corp., valued at more than \$6 million, for an initial delivery quantity of aft fuselage sections and ailerons for the F-105 Thunderchief.

• **Hiller producing utility copters**—Production of Hiller Aircraft Corp.'s 12E three-place utility helicopter, powered by a 305-hp Lycoming engine, is under way. Company says it is the highest-powered helicopter in either the three- or four-place class.



Boeing 707-120 Receives CAA Certification

Civil Aeronautics Administration, on September 23, awarded Boeing Airplane Co. Type Certificate No. 4A21, making the 707 the first U.S.-built jet transport to gain CAA approval.

The CAA certificate, presented by Commerce Secretary Sinclair Weeks (center) and CAA Administrator James T. Pyle to Boeing president William M. Allen (right), applies to Pan American's "long body" version of the 707-120 and sets the stage for its introduction in airline operation October 26.

The 707 approval was granted under CAB's special regulation SR422 which was adopted last year for turbine-powered aircraft. By acquiring certification before September 30, Boe-

ing was able to avoid the restrictions of the amended version SR422A, which industry feels is unrealistic. SR422 approves the 707-120 for a gross ramp weight of 248,000 lbs.; takeoff gross 246,000 lbs., and maximum landing weight of 175,000 lbs. The airplane zero fuel weight is 165,000 lbs.

At completion of the CAA test program, the three 707s involved logged a total of 698 hrs. and 40 min. in 537 flights. Of this time, 330 hrs. were devoted to CAA tests, and the remainder to Boeing's own program.

In the course of certification, a maximum true airspeed of 670 mph (Mach 0.95) was reached. Maximum altitude was 42,500 ft., and on one CAA flight the gross weight was 260,000 lbs.



Goodyear Convoplane VTOL Is Under Study

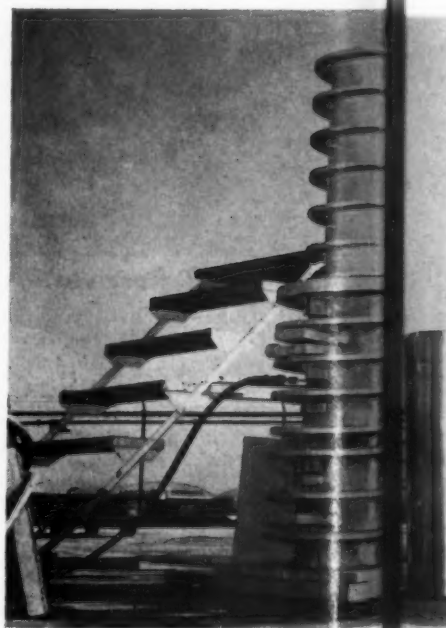
Artist's concept depicts Goodyear Convoplane VTOL being studied under contract awarded last year by Army's Transportation Research and Engineering Command. Vertical lift and high-

speed forward flight would stem from varying airflow to and from imbedded rotor system. The aircraft is now being subjected to windtunnel tests to determine flight characteristics.



SeaMaster Becomes Self-Beaching

Martin P6M SeaMaster taxis out of water under its own power at company's Baltimore seadrome after engaging beaching vehicle under water. Once on land, pilot takes over steering and braking systems of beaching vehicle.



New Airway Pro

Use of new "explosive forming" techniques for aircraft production are demonstrated by North American in fabrication



Researching Better Ceramics

Engineer at Westinghouse ceramics development laboratory, East Pittsburgh, Pa. checks temperature inside new hot press, part of new integrated high-temperature induction melting, sintering and pressing facility placed into operation for ceramics research and development.



Breakthrough at AiResearch

AiResearch Manufacturing Division, The Garrett Corp. moved into the roster of producers of prime helicopter powerplants with the announcement that three of its GTC 85-35 compressor turbines power McDonnell Aircraft's Model 120 utility helicopter. Model 120 cruises at 109 mph, has 98-mile range.



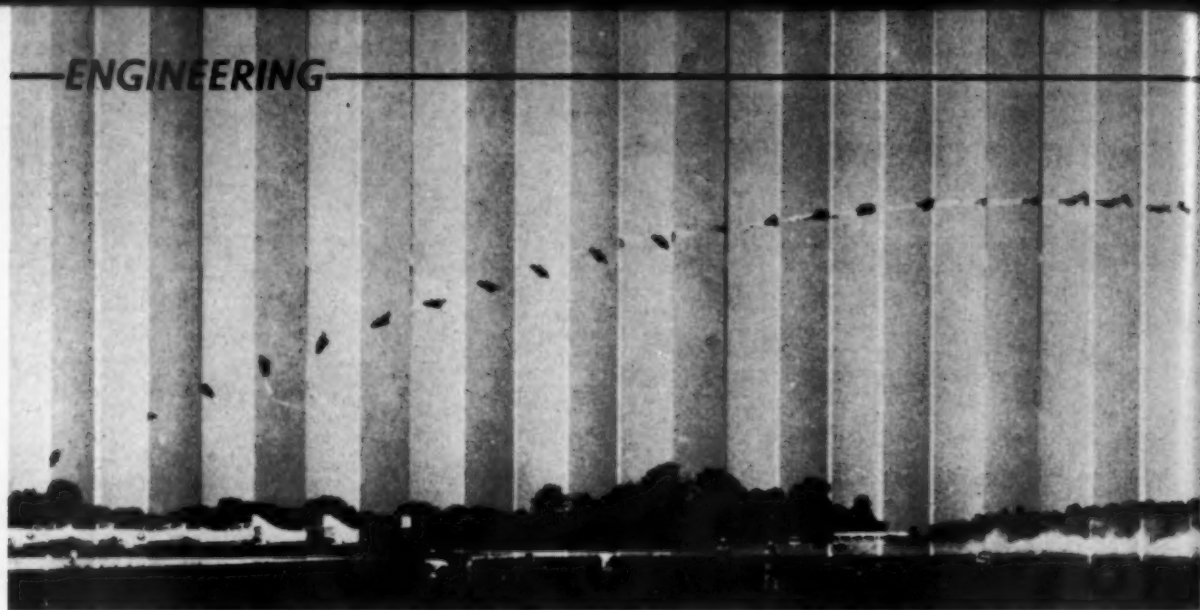
by Airflow Process

of wingtip tank section for NAA's new T2J Navy jet trainer. Cone blank is in center, die at left.



First Flight of the Sabreliner

North American Aviation's front-running contender for USAF's "off the shelf" small utility jet is shown during first flight at Palmdale, Calif., September 16. NAA jet grosses 15,330 lbs., cruises at 500 mph at 45,000 ft. Powerplants are aft-mounted GE J85s.



THE PILOT EJECTS as the plane lifts. Seconds later his chute opens and the Navy has completed another successful test of . . .

Ejection on Takeoff—It Can Be Safe

By Homer U. Tsakis

In August, 1957 a young RAF flight lieutenant named Sydney Hughes ejected himself from the rear seat of a Grumman F9F-8T jet trainer as it broke ground on takeoff. The spectacular test, from which Hughes emerged unscathed, was the culmination of an extensive program of evaluation, engineering and testing originated by the Navy's Bureau of Aeronautics.

The program represented a continuation of BuAer's efforts to enlarge the practical flight envelope of the ejection seat and to reduce the physical hazards of separation.

Although ejection as a means of escape from disabled aircraft had a history of almost 14 years (the Germans first tried it in 1944) it had not achieved the life-saving potential which it first promised. In fact, statistics compiled by the U.S. Naval Aviation Test Center at Norfolk, Va., showed that as late as 1956, ten years after the first live ejection by the U.S. Navy, ejections were more dangerous than bailouts. This disconcerting fact was attributable to the limitations of the ejection equipment, limitations that not only severely restricted the conditions under which an ejection could be attempted but also were directly responsible for injury to the personnel. In an attempt to rectify this situation the Navy sought an ejection seat which

could be utilized over a wide range of speeds and at ground level as well as altitude.

The ground-level capability was particularly important, since nearly two-thirds of all fatalities associated with jet aircraft crashes occur on either takeoff or landing, when the pilot of a disabled aircraft has no choice but to remain with his ship. In these cases 94% of the resulting crash landings are fatal and have accounted for the loss of 277 Navy pilots in a recent year.

• **Escape system**—The Martin-Baker ejection seat, Type Mark A5 is not merely a seat but a complete escape system. The principal components of the system are: the seat assembly, the parachute pack, the ejection gun and guide rails, the drogue gun and the two drogue parachutes.

The basic seat structure is a lightweight fabricated unit stressed for crash loads as high as 40GA. A framework of two vertical side beams bridged by three cross members supports the seat pan, drogue parachutes container, drogue gun and time-release mechanism. The inside of the side beams are fitted with three pairs of "slippers" which engage with the guide rails on the cylinder barrel of the ejection gun.

The parachute used in the "horseshoe" pack is a standard Irvin 24-ft. canopy model specially packed to insure unrestricted deployment upon ejection. The back type pack is secured to the seat structure by two restraining straps and its horseshoe shape is

tapered to fit the wearer's shoulders. This shape permits the shoulder harness loop strap to pass beneath the arch of the horseshoe into the harness loop strap release lock while leaving the greater part of the personnel parachute stowed above the arch and free for clean extraction.

A three-section telescopic ejection gun supplies the power for ejection. The gun provides an 83 ft./sec. velocity with approximately 20Gs being experienced. The power is obtained from a single primary and two auxiliary charges. Firing of the primary charge forces the inner and intermediate tubes to rise as a consequence of the generated gas pressure. Sequential to the primary charge firing the two auxiliary charges are fired as the seat travel reaches 14 and 31 in., respectively.

The drogue parachute container, which comprises the uppermost section of the seat structure also houses the faceblind and is designed to act as a canopy breaker for straight-through ejection. The Martin-Baker drogue parachutes system employs a small controller drogue and the larger stabilizer drogue. These drogue chutes are deployed by means of a cartridge-loaded drogue gun, fired automatically half a second after ejection.

A metal piston fired from the gun is attached to and consequently extracts the controller drogue from its stowage. The controller, when deployed, extracts the main stabilizer drogue from the container and tilts the seat into a horizontal attitude. A nylon line connects the controller and main drogue, allowing the controller drogue to be

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fired well clear of the seat wake and slightly delaying the extraction of the stabilizer drogue in order to apply the deceleration progressively.

The seat assembly also incorporates: an alternative firing handle in the seat pan; leg restraint cord release lever; harness loop strap snubber control lever; time-release mechanism which incorporates a barostat and "G" controller; seat pan raising handle; manual override lever; and the top latch (seat lock) mechanism.

• **The ejection sequence**—From the time the pilot decides to leave his aircraft until he is floating gently towards earth he has only one operation to perform—pulling of the face blind handle. Actuation of either the firing handle attached to the face blind or the alternative firing handle in the seat pan will begin a series of automatic actions culminating in the opening of the personnel parachute at a safe altitude.

When the protective face blind is pulled down to its fullest extent the cable attachment extracts a wedge-shaped sear from the ejection gun firing mechanism and fires the primary cartridge. The seat and occupant are immediately ejected from the aircraft with the firing of the two auxiliary cartridges occurring as the ejection gun tubes are telescoped upwards.

Leg restraint is accomplished on ejection by means of a simple system set up when the seat is first occupied on the ground. A web strap incorporating a metal loop is fitted to the calf of each leg. A nylon line attached to the leg restraint cord lock on the front of the seat pan is passed through each of the metal loops, through a snubber on the bottom edge of the seat pan, and attached to a fitting on the floor of the cockpit. On ejection the line is drawn taut, pulling the feet together and against the seat and then fails the fastening shear rivet at the floor fitting. The line is then held taut by the snubber until it is released automatically, in conjunction with the harness, by the time-release mechanism.

On ejection two trip pods attached to the bulkhead behind the seat withdraw sears which set off the cartridge-operated drogue gun and the time-release mechanism. Firing of the drogue gun extracts the controller drogue which in turn extracts the stabilizer drogue. The two drogues when fully deployed stabilize the seat and occupant and put them into a convenient attitude for separation. The connection between the deployed drogues and the seat is released by

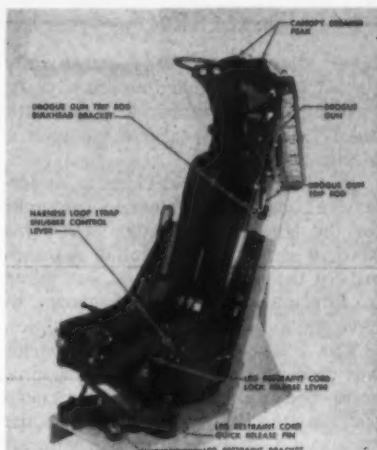
the action of the time release mechanisms.

The next sequence includes: freeing of the leg restraint cord line and harness assembly from the seat; disconnecting of the face blind; and deployment of the personnel parachute. This sequence, however, may be delayed for a time interval which is determined by the G controller and/or the barostatic control which are part of the time-release mechanism.

The time delay required before the drogues deploy the personnel parachute is dependent upon the speed at which ejection occurs and governs the height from which safe ejections can be made. At low speeds the delay required to ensure safe practicable ejection at ground level is approximately 1.5 seconds. However, at the higher speeds the delay must be at least 3 seconds to allow adequate deceleration. To make the seat safe for ejection at all altitudes and at all speeds from touchdown to above Mach 1, an automatic G controller is fitted to the time-release mechanism unit. This controller is sensitive to the loads imposed by deceleration and will control the time-release mechanism until the loads have been sufficiently reduced to allow safe separation from the seat and deployment of the personnel parachute.

On high altitude ejections the barostatic control prevents operation of the time-release mechanism until the seat and occupant have fallen to an altitude of approximately 10,000 ft. This delay reduces prolonged exposure to low temperatures and rarefied air and enables the occupant to ride down in the seat, stabilized by the drogues and supplied with oxygen, to a more tolerable altitude. If ejection occurs below 10,000 ft., the time-release mechanism will not be affected by the barostatic control and the sequence will occur approximately 1¼ seconds after release by the "G" controller.

When the time-release mechanism releases the drogues from the seat they

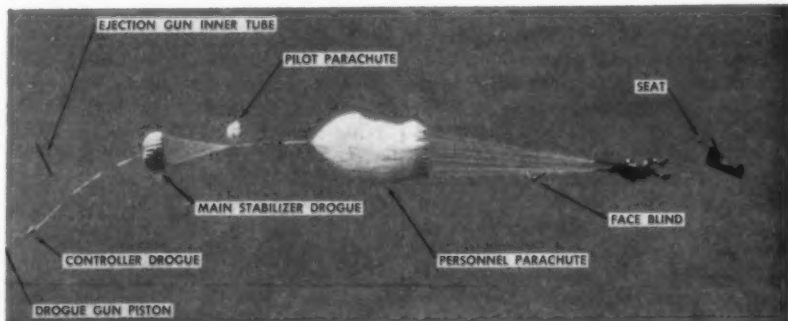


MARTIN-BAKER escape system and seat.

pull on a link line which disconnects the face blind and deploys the personnel parachute. The occupant is momentarily prevented from leaving the seat by two straps clipped to the seat pan, until the parachute lifts him clear of the seat to descend in the normal manner. This arrangement eliminates the possibility of a collision between the seat and the occupant after separation.

If the seat mechanism is damaged so as to prevent its operation, either by failure of the seat to eject or failure of the automatic gear to operate, provision is made for the pilot to make a free bailout. He may use the personnel parachute or, after ejection, separate himself from the seat by manually unlocking the seat harness assembly from the seat and pulling a ripcord "D" ring to deploy his personnel parachute.

• **Evaluation and testing**—The Navy, as early as 1938, had made live "ejections" on a test tower at Lakehurst, N.J. These tests, which used a prototype Martin-Baker seat, had indicated that it was possible for a man to survive the G loads necessary for ejection. An actual live ejection as part of the U.S. Navy program did not take place, however, until October 1946, when a



SEQUENCE OF SEPARATION is demonstrated by various positions of units.

naval lieutenant was successfully ejected from a modified attack aircraft, traveling at 250 mph, at a safe altitude. This test was also made with a Martin-Baker seat.

In 1956 the Navy decided to undertake a complete evaluation program for the latest Martin-Baker seat. This Mark 4 version was virtually a standard for the Royal Navy and Air Force in England and had been shown to have ground level ejection capabilities.

The F9F-8T two-seater jet trainer was chosen as the aircraft for the program because of Grumman's experience in the incorporation of escape systems in high-performance aircraft and because of its recommendation that the aircraft be equipped with the M-B Mark 4 seat. Thus the evaluation of the seat was carried out, in part, in conjunction with the flight-test program of the aircraft.

The initial step in the program was the construction of a full-scale mockup of the cockpit section of the F9F-8T. This mockup was shipped to the Martin-Baker Co. in England for the fitting of the special version of the seat, the Mark A5, and the accom-

plishment of static firings.

The mockup, which was complete to canopy and canopy actuation system, was next installed on a rocket sled for the second phase.

The anthropomorphic dummy used in the tests was fully dressed in standard Navy gear and was fitted with three accelerometers in the chest (one in each plane), one in the hip area, and one in the head. A telemetering package was incorporated in the chest.

The successful results of the sled tests indicated: ejection through the canopy at low airspeeds had no adverse G effects upon the occupant; the end velocity and height of ejection through the canopy was not appreciably different from open canopy ejections; verification of calculations which showed that safe ground-level ejections were possible. With this background and information provided by the static and sled tests, the Grumman flight test division next moved on to the in-flight firings.

The in-flight firings again utilized an instrument anthropomorphic dummy which was fired successfully from the rear seat of the F9F-8T.

Qualification of the Martin-Baker seat and the escape system of F9F-8T did not require a live ejection. However, Grumman and BuAer arranged with the Martin-Baker Co. for the live ejection that took place at Patuxent River, Maryland on August 28, 1957.

Plastics in Electra

Turboprop transport uses variety of new materials

Lockheed is using plastics in the turboprop Electra in many applications that formerly required metal. However, Lockheed's Production Engineering Department, headed by E. A. Green, has made certain that no parts were fabricated for the sole purpose of using new materials.

Nearly all types of plastics are used—glass-fiber-reinforced polyester, rag-reinforced malamine, and unreinforced vinyl, nylon and teflon. But most used are glass-reinforced polyester laminates and mat-reinforced polyester moldings.

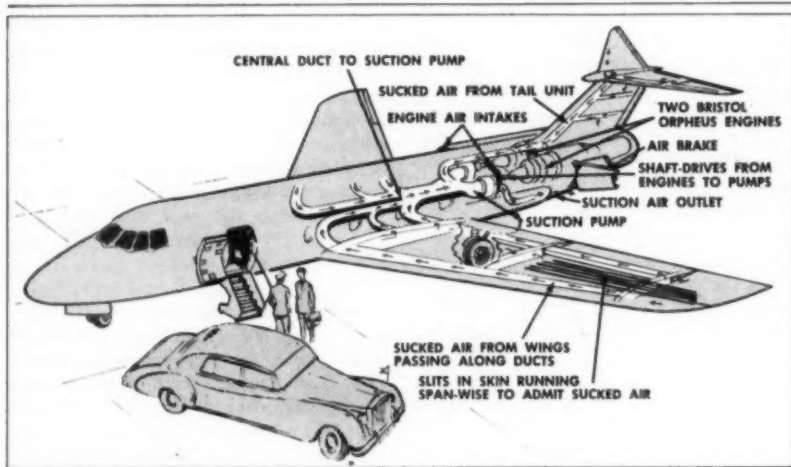
In the Electra's air-conditioning system, metal low-pressure ducts were heavy because thickness is dictated by production requirements. By using cloth laminates, Lockheed has cut the weight of these ducts at no increase in cost. And because of its insulating qualities when used with some padding, cloth laminates may also be used in high velocity air ducts.

The dielectric property of glass cloth laminates makes them ideal for radomes, antenna fairings and junction boxes. And the high impact strength of some plastics permits their use in the roof and side walls of the baggage compartment. These parts are made of polyester fabric laminate, designed on a module basis.

Interior trim in the Electra has many plastic parts. To meet requirements of fine finishes capable of withstanding hard use, Lockheed is experimenting with various gel-coats. Because of its appearance, flexible vinyl trim is used in the ceiling and walls. Partition facings are of Formica, usually in wood grain finishes.

Windows in the Electra are plex 55. This new plastic permits a weight reduction of 300 lbs. per airplane through rigid pane installation. Both the inner and outer panes are capable of taking full pressure load alone.

Lockheed readily admits its plastics applications can stand improvement, and certain problems exist for which there is no ready solution. Integral color in the plastic is still to be satisfactorily obtained, and there is also a need for still higher strength values and better production methods.



Boundary Layer Suction Boosts Range of HP 113

Boundary layer suction on the Handley Page 113—latest (paper) entry in the small jet market—increases the range of the 10-12 place transport by 61.5%, the company reports.

Maximum range is extended from 3,870 to 6,300 miles. A similar gain, from 2,240 to 3,640 miles, is realized at maximum payload.

Suction is accomplished by two four-stage, axial-flow suction compressors, driven by twin Bristol Orpheus engines. Air passing over the tail and wing surfaces is maintained in laminar flow by suction through machined slots, while air on the wing leading edges and access doors is collected by porous

steel. Low-speed control effectiveness is assured by an automatic blowing system which delays control-surface stall.

The HP113 has an overall length of 71½ ft., height of 17 ft. and passenger compartment volume of 900 cu. ft. Wing span is 71½ ft., tapering from a center line chord of 15½ ft. to tip chord of 6¼ ft. Sweep-back at quarter chord is 35°. Aspect ratio is 6.6, wing loading 47.1 psf.

The fuel capacity is 2,870 U.S. gallons; design takeoff weight 36,500 lbs.; payload, 2,520 lbs. Stage length with 1,000-lb. payload is 4,330 mi. Cruise speed is given as 528 mph.

Choice of Engines

Lockheed offers variety of engines for its utility jet

Lockheed-Marietta is offering a wide variety of engine installations for the JetStar.

A four-engine version aimed at military sales offers these choices:

The General Electric J85 with a sea-level static thrust of approximately 2,450 lbs.

Fairchild's J83, also rated at about 2,450 lbs. thrust.

The JT12, made by Pratt and Whitney. This engine produces 2,900 lbs. of static thrust and, at cruising speed and altitude, has a specific fuel consumption of 1.145 lb./lb./hr.

In the twin-engine configuration, Curtiss-Wright's TJ37 will replace the Bristol Orpheus engines presently being used. The TJ37 produces 4,850 lbs. thrust at sea level, with a cruising specific fuel consumption of 1,312.

Expected flight-test figures have been released on the J85 and JT12 installations of the four-engined airplane. In addition to the data represented in the graphs the following results were obtained:

At a gross weight of 28,000 lbs., the J85 version gives a sea-level rate of climb of 4,100 fpm at normal power on four engines, 3,800 fpm on three engines at military power. With the ad-

dition of two 640-gal. external fuel tanks, the gross weight goes to 38,000 lbs. and the rate of climb drops to 2,700 and 2,500 fpm, respectively.

For the 28,000-lbs. gross weight, the JT12 installation will climb at 5,500 fpm on four engines and 4,300 fpm on three engines.

Test results for the J83 version should be available soon.

Rate of climb performance for the twin-engined TJ37 model indicates a 4,500-fpm capability with both engines set at normal power and 1,900 fpm on single engine at military power.

In the clean (no external fuel stores) configuration, the J85 and JT12 versions show service ceilings of 47,000 and 48,000 ft., respectively. The addition of external tanks reduces these to 45,000 and 46,000 ft.

The TJ37 offers a service ceiling of 43,000 ft. clean and 42,000 ft. with fuel pods. On single engine, ceilings of 26,000 and 25,000 ft. were obtained.

The true value of the external "glove" tanks is seen in the data for operating range. For the J85 version, the outside cells raise the range from 1,600 nautical miles to 2,700 with a ten-passenger payload at 45,000 ft. On the TJ37 installation, the range increase is from 1,500 to 2,400 n.m. The greatest gain is in the JT12 model, which gives a range rise of 7% from 1,520 to 2,750 n.m. for a 10,000-lb., or a 7.4% gross weight increase.

Different Overhaul Periods For Turboprop Components

Allison's 3,750-eshp 501-D13 turboprop engine, powerplant for Lockheed's Electra and recipient of CAA approval of a 1,000-hrs. overhaul life, is slated to be a guinea pig for a new concept. CAA plans to establish separate overhaul periods for individual engine sections such as accessory drives and gear boxes, propeller reduction gear, compressor, turbine and combustion chamber.

In order to set up realistic overhaul periods for these sections, the first four engines to go into service—with Eastern Air Lines in December—will be torn down for inspection at 800 hours. Two of these engines will be torn down again at 900 hours, and all four will be stripped when they reach 1,000 hours.

... Engineering News Briefs

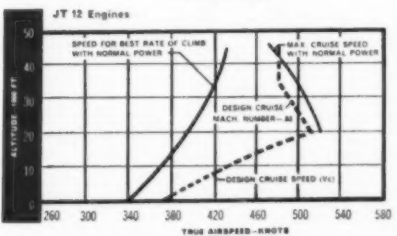
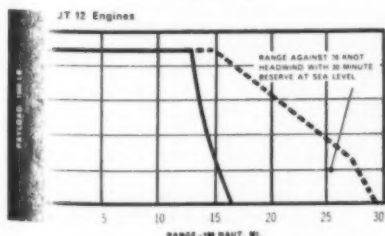
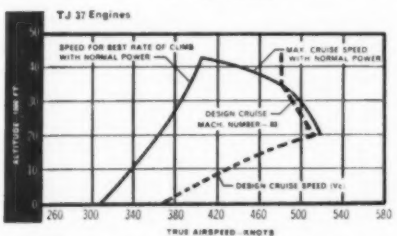
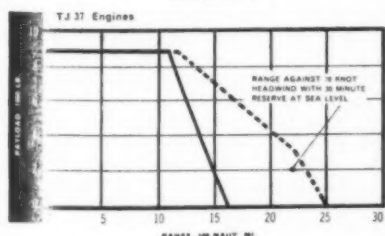
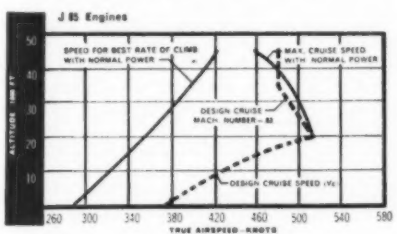
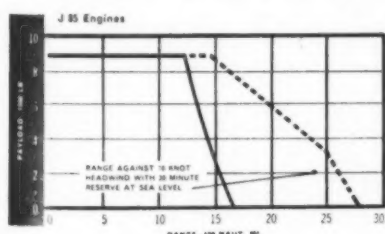
• **Turbojet certification**—General Electric's CJ-805-3 turbojet engine, powerplant for the Convair 880, has received its CAA final type certificate. Performance details on the engine, commercial version of the classified J79, will be released in December.

• **T66 preflight testing set**—Solar's 55-shp T66 fixed-turbine engine being developed for Navy for use in one-man helicopters will undergo 40-hr. preflight testing this year. The engine will be installed in a Gyrodyne Rotorcycle which will be "imbedded in concrete" for the tests. The Rotorcycle will be used for flight tests at a later date, but Solar isn't saying when.

• **707 performance bettered**—A greater angle of sweep and lower thickness ratio, obtained by modifying the in-board leading edge, has raised the Boeing 707-720 cruise speed to 614 mph at 22,700 ft. The aircraft will be introduced into service in 1960.

• **KC-135 modification**—Ryan-San Diego is working two shifts on modification of KC-135 aft section. Ryan is subcontractor of Boeing on the fuselage components, and is installing stiffening straps to improve high-speed flight characteristics.

• **Ham-Stan props on KLM Electras**—Hamilton Standard, Division of United Aircraft Corp. has received a CAA type certificate for its 54H60 propeller for use on the Lockheed Electras ordered by KLM Royal Dutch Airlines. Other Electra buyers are using Aeroproducts props.



DASH LINE in Payload vs. Range curves represent addition of external fuel cells.

CAB Report on DC-7/F-100F Collision

Synopsis

On April 21, 1958, about 0830, an Air Force F-100F and a United Air Lines DC-7 collided at 21,000 feet over a position about nine miles southwest of the Las Vegas, Nev. VOR station. The position was on Victor Airway 8 about 1 1/4 miles to the right (southeast) of the centerline. Both aircraft fell, uncontrolled, and crashed, killing the 42 passengers and five crew members of the DC-7 and the two Air Force pilots of the F-100F.

The accident occurred in clear weather conditions while the DC-7 flight, from Los Angeles to New York, was proceeding normally according to an IFR (Instrument Flight Rules) flight plan and clearance, and while the F-100F was executing a simulated jet penetration, part of an instrument training flight which originated at Nellis Air Force Base. The flight was according to a local VFR (Visual Flight Rules) flight plan.

The accident occurred in VFR conditions which, under the Civil Air Regulations, placed responsibility on the pilots of both aircraft to avoid collision through visual separation. This collision was the result of a high rate of near head-on closure at high altitude together with the human and cockpit limitations.

The accident occurred during an Air Force instrument training operation pursuant to Air Force policies which did not take adequate account of human limitations to avoid collision by visual means, although the limitations were recognized in other training operations and were known to the Air Force.

The Board determined that the probable cause of this collision was a high rate of near head-on closure at high altitude; human and cockpit limitations; and the failure of Nellis Air Force Base and the Civil Aeronautics Administration to take every measure to reduce a known collision exposure.

Analysis

The three principal areas of collision damage and related marking furnished the foundation for the Board to make a reasonable determination of the inflight collision sequence. This, together with operational and eyewitness information, also enabled reasonable deductions as to the flight paths of the aircraft as they approached collision.

The analysis indicated that initial contact occurred between the leading edge of the DC-7 right wing at station 574 and the leading edge of the F-100F right wing 132 inches outboard of the aircraft centerline. The two wings progressively penetrated one another until the outboard portion of each was severed; in the case of the DC-7 the wing was severed along a swath line 34 degrees aft and outboard, and in the instance of the F-100F along a swath line 12 degrees aft and inboard.

A second cut in the DC-7 wing, located about 24 inches inboard of the first, was made by the right horizontal tail of the F-100F which penetrated rearward until the cutting object, the outboard portion of the tail, was destroyed. This entire collision sequence occurred in less than 1/100 of a second.

A vector diagram, using the 34-degree fracture line in the DC-7 wing, estimated true airspeeds of the DC-7 and F-100F of 312 and 444 knots, respectively, and assuming a small angle of descent for the F-100F, indicated that at impact the aircraft were on quartering head-on courses about 122 degrees apart with a closure speed of about 665 knots. Believing the DC-7 was flying a magnetic heading to follow Victor Airway 8 and was in nearly straight and level flight, at collision the heading of the DC-7 was 23 degrees magnetic and the heading of the F-100F was 145 degrees magnetic. This heading for the F-100F seems reason-

able because the aircraft was to the right of the desired 170-degree track and a normal correction to track procedure required a heading of 140 degrees. Because of its position, right of track, it would seem probable that the flight approached KRAM from the basic instrument practice area located east of the facility. Because of unknown factors, any estimate of the amount of turn required to the outboard heading cannot be determined or reasonably estimated.

The swath cut through the DC-7 wing by the F-100F wing was approximately two feet wide and the edges were nearly perpendicular to the plane of the DC-7 wing. For a wing eight inches thick and swept more than 45 degrees at the leading edge to have cut a 24-inch vertical swath through the DC-7 wing it would have been necessary for the F-100F wing to have contacted the DC-7 wing at a considerable angle of attack relative to the collision course and for the aircraft to have been rolled beyond a 90-degree bank.

Paint scrape marks on the bottom of the F-100F right wing showed that it was the bottom side of the F-100F wing which made the contact, indicating that the F-100F was banked to the left. The distance between the swaths cut by the F-100F wing and tail surface indicated that the aircraft was in approximately a 15-degree negative angle-of-attack attitude at the instant of collision. The F-100F was also in a 12-degree nose-down attitude relative to the DC-7. An approximate 4-degree angle of descent would have been normal during the penetration.

From the angles of bank, descent, and attack indicated, as well as eyewitness information obtained, it is the Board's view that a last second evasive maneuver was initiated by the F-100F instructor

intending to avoid the DC-7 by diving to the left, down, and under the aircraft. The F-100F passed the nose of the DC-7, narrowly missing its No. 4 propeller. Then the aircraft collided in the attitudes described.

To the Board the 15-degree negative angle of attack seems extreme even under the circumstances. Because of this it is noteworthy that the angle would be reduced one degree for each degree that the DC-7 was yawed to its left. It would also be reduced by a greater speed than was estimated for the aircraft. Of the two possibilities, it is believed most likely that one of the pilots of the DC-7 saw the F-100F in the last seconds before collision and initiated a desperate evasive maneuver to avoid it.

Since the F-100F evasive maneuver was not initiated in time to be successful it can be assumed that the course of the F-100F was not altered appreciably during the maneuver. The two aircraft may then be backed apart from the point of collision for a reasonable distance along their courses at impact so that their relative locations to one another may be established and the possibilities of the pilots having sighted each other evaluated.

The vector diagram indicates that the DC-7 was approaching the F-100F on a bearing 24 degrees to the right of the nose of the F-100F and it would have been at nearly eye level. This location falls directly behind the opaque canopy ring of the F-100F and, assuming no head movement, would make sighting the DC-7 at more than a mile nearly impossible and at more than one-half mile very difficult since at that distance the eyes of only one of the pilots would be in position to see the DC-7 clearly.

The relative angle of approach of the F-100F to the DC-7 was from 34 le-

degrees to the left and approximately 5 degrees above the horizon. This angle of approach falls behind the corner post between the captain's clear vision window and side window. The captain would have been able to see the F-100F approach with only one eye but if his head were two or three inches to the left of normal he could not have seen the aircraft at all until it was much too late to avoid the collision. The approach of the F-100F should have been unobscured to the copilot of the DC-7 through the captain's front windshield. The flight engineer on the DC-7 had no opportunity to observe the approach since his location in the cockpit was too high and too far aft to permit any upward visibility.

While the Board recognizes the difficulties involved in maintaining visual separations at high rates of closure as hereinbefore described, it must continue to provide for VFR operations in the Civil Air Regulations. Regulatory prohibition of VFR operations creates but one alternative—the exercise of positive control. The immediate implementation of full positive control would rule a very large percentage of essential traffic from the air. The reason is simply that the present air traffic control capacity is inadequate to handle so great a volume.

On June 15, 1958, an important step was taken in the initiation of positive control; however, it will be several years before the major portion of the airspace will be accommodated. This goal will be attained by a gradual extension of positive control commensurate with the increase of air traffic control capability. The Board is now considering whether the advent of civil air carrier jets requires regulation making mandatory the use of positive control airspace and whether certain speed limitations will have to be applied in controlled airspace not subject to positive control.

In the interim period the Board will continue to apply the visual flight rules with whatever refinements the state of the art permits. In addition to the regulatory steps already mentioned which have been taken to enhance visual separation, the Board has other regulatory matters under consideration directed toward the same goal. Some of these are the use of standard altimeter settings, the use of fluorescent paint, a lowering of the floor of the Continental Control Area, the increase of visibility and distance from cloud requirements for highspeed aircraft, and extension of speed control.

NOTE: The accident report above is taken from Civil Aeronautics Board file. However, the section dealing with investigative procedures and the official Conclusion have been omitted. Similarly, the portion of the Synopsis which deals with the Board's recommendations has been eliminated. AMERICAN AVIATION's summary of the conclusions and a report on Air Force-CAA action on the Board's recommendations is included at right.

... And What Happened As a Result

In retrospect, and somewhat in support of CAB's findings, the Las Vegas area was a natural for the DC-7/F-100F mid-air collision on April 21.

Because of the mountainous terrain, the bottleneck created by the existence of no fewer than eight immediately adjacent military practice areas, and the fact that Victor Airway 8 passes over Nellis AFB, it was, and still is, inevitable that instrument approaches to the busy AF training center be made along the equally congested airway.

At the time of the accident, the procedures for practicing high altitude, VFR penetrations to Nellis relied upon the see-and-be-seen concept to provide for separation between jets and airliners in the area.

It would be misleading to say that corrective action taken by CAA and Air Force in an agreement which became effective Aug. 1 is 100% foolproof; however, it is about as far-reaching as possible without becoming impracticable.

The agreement is based on a special regulation (SR-424) adopted by CAB on May 28 and implemented by CAA on June 15. This regulation allowed CAA to designate as positive control airspace the altitudes between 17,000 and 22,000 ft. on Victor Airway 8 in the Las Vegas area. Features included in the agreement are:

- Aircraft flying in local traffic pat-

terns at Nellis AFB will remain at or below 9,000 ft.

- When heading for training areas, they will not climb above 9,000 ft. until after they have cleared the airway.

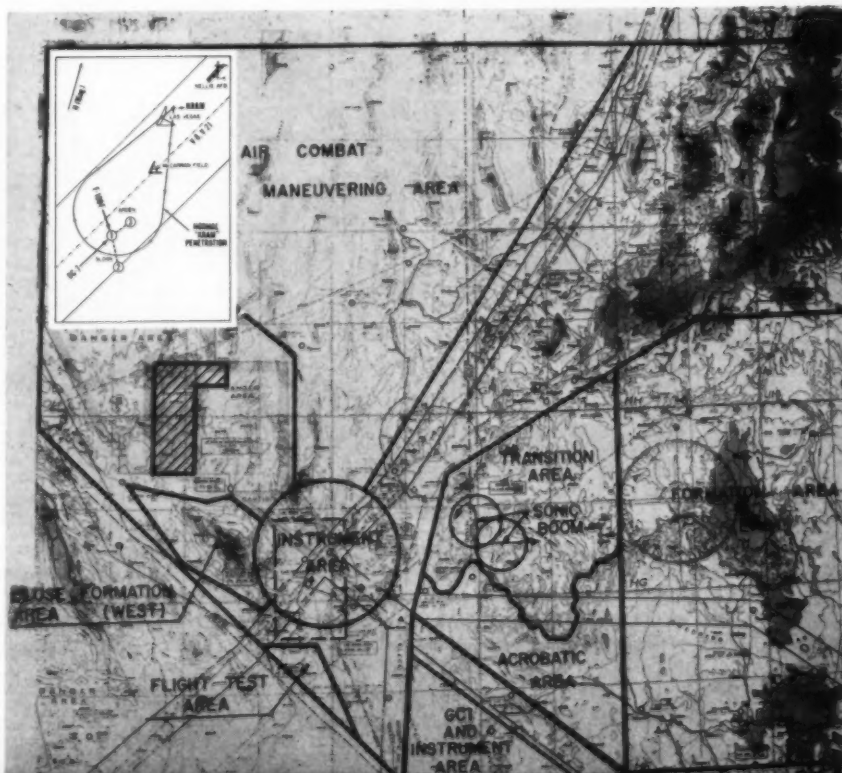
- When crossing between training areas on either side of the airway, the jets will fly between designated points and at altitudes above 25,000 ft.

- High altitude VFR penetrations to Nellis will be started above 23,000 ft. and, until they are below 17,000 ft., aircraft will descend off the airway. Las Vegas Approach Control will, within their capabilities, give these aircraft details of conflicting traffic.

- Nellis will keep Las Vegas Approach Control advised of the status of VFR training in the area, and this information will be passed to CAA's Salt Lake Center.

- Salt Lake Center will restrict en route IFR traffic to altitudes at or above 10,000 ft. in the Las Vegas area. Since airlines have agreed among themselves to file IFR flight plans when operating above 10,000 ft., this will reduce the collision potential.

But one loophole exists. There is no regulation prohibiting en route aircraft from flying VFR between the minimum area altitude of 6,500 ft. and the controlled airspace floor at 17,000 ft. (In map below, military practice areas surround collision point—No. 1 in inset—F-100F and DC-7 impact sites are 2 and 3.)





Blind-Flying Training Hoods

Hardman Tool & Engineering Flight Safety Division has developed safety hoods which provide blind flying conditions for the practicing pilot on the left, yet allows full VFR view for

the check pilot seated on the right. Available for all types of single and multi-engine aircraft, system is light-weight and designed for cockpit storage.

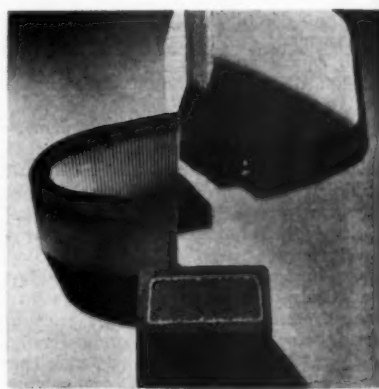
Circle No. 100 on Reader Service Card.



Life Raft

Developed by Goodyear Tire and Rubber Co. and Walter Kidde & Co., Inc., 25-place rubberized-nylon raft is designed for Douglas DC-8s, Convair 880s and Boeing 707s and 720s slated for overwater operations. The raft weighs about 130 lbs. and is equipped with fishing gear, flares, first aid kits, signal mirrors, dye markers, a flashlight, sea anchor, fresh water and rations.

Circle No. 101 on Reader Service Card.



High-Heat Honeycomb

Corning Glass Works has developed new Cercor honeycomb structures which are said to be capable of operating continuously at 1,290°F with virtually no thermal expansion.

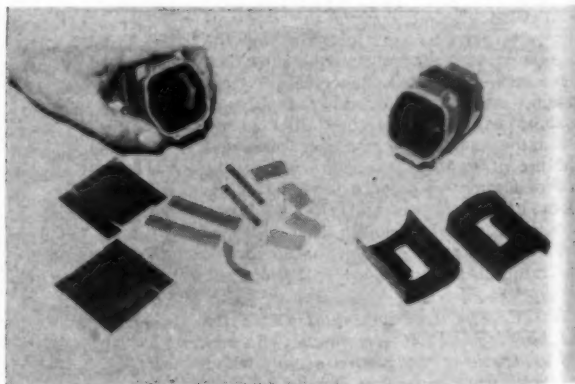
Circle No. 102 on Reader Service Card.



Transistor Radio

Aircraft Components, Inc. has developed a new all-transistor CAA weather and broadcast band receiver. Measuring 1½" x 3½" x 7¾" and weighing 28 oz., radio operates off four pen-light batteries. Loop allows it to be used as a direction finder.

Circle No. 103 on Reader Service Card.



Preformed Insulators

Stevens Products, Inc. has developed a two-piece preformed insulator. Old method required 16 pieces. Substantial cost reduction and fewer rejects due to leakage at the edges of small die-cut pieces are claimed for two-piece insulator.

Circle No. 104 on Reader Service Card.

... Product Briefs

• **Radiation detector**—Developed by Douglas Aircraft Co., Inc. for ground personnel working on airborne radar, pocket-size device is said to provide continuous indication of radiation and ample warning before exposure becomes critical. Erickson Products Co. has been licensed by Douglas to produce the device.

Circle No. 106 on Reader Service Card.

• **Aircraft tow vehicle**—The Towkar Model TK30 by Silent Hoist & Crane Co. is said to be capable of a 30,000 lb. drawbar pull which can accommodate most of the large military and commercial turbine powered transports. Equipped with a 260 hp heavy duty engine (gas, diesel or LP gas), vehicle is said to be able to tow aircraft at speeds up to 26 mph.

Circle No. 107 on Reader Service Card.

• **Variable temperature oven**—Designed by Airtronics, Inc., high-stability unit is in use for testing and processing quartz crystal units, calibrating thermometers, bolometers and thermocouples as well as small electronic components. Oven requires a maximum of 100w and can be supplied for 115v

at 60 or 400 cps, or for 28v dc. Inside dimensions are 5½" x 12" and temp. range of standard unit is 30 to 300°C. Circle No. 108 on Reader Service Card.

• **Autopilot navigation computer**—Designed by Dynavia Engineering Corp. for the business aircraft market, model ANC-2 computer utilizes standard inputs from an omni receiver and stabilized magnetic heading to furnish a continuous control signal to the yaw axis of an electronic autopilot for automatic en route navigation. Weighing 4 lbs., unit's function is to lock the autopilot to a VOR radial by steering the aircraft on a heading that will precisely track the true center of the beam from any distance at which the signal can be received to a point directly over the omni station.

Circle No. 109 on Reader Service Card.

• **Turbine temperature indicator**—Miniature, hermetically sealed, transistorized unit by B & H Instrument Co., Inc. measures jet engine turbine inlet temperature and exhaust gas temperature. Unit contains a potentiometer with a 144" slidewire, of infinite resolution, embedded in the edge of a lami-

nated mylar tape. Measuring 3" x 7" and weighing 1.75 lbs., unit operates on an external power source of 115v 400 cycle and has an accuracy of ±1% in the 500° to 1,000°C.

Circle No. 110 on Reader Service Card.

• **Wiring fastener**—Designed for use in aircraft and missiles, new cradle clip fastener by Electrovert, Inc. is adaptable to various sizes. Use of Du Pont's Viton synthetic rubber is said to resist oils, fuels and solvents at high temperature.

Circle No. 111 on Reader Service Card.

• **Wire securing device**—Designed by Dakota Engineering, Inc., new tool called Bundletie pliers, is designed to facilitate fast, positive bundle-tying with self-locking nylon straps.

Circle No. 112 on Reader Service Card.

• **Small hardware counter**—Portable unit by Post Electronics is said to feed and tabulate 300 to 1,000 pieces a minute. Items are fed or loaded into a Syntrol vibrating tray which drops them to a special conveyor belt, which in turn separates items as they move through a photoelectric sensing device. Circle No. 113 on Reader Service Card.

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By Fred S. Hunter

One thing for sure, standard-fare passengers in the new jet transports will have plenty of elbow room. Coach passengers may be a little crowded. At the time Boeing and Douglas first announced their big jets no one considered anything except five-abreast seating. This would be needed for lower seat-mile costs to make the jets pay off, everybody said, and both the 707 and DC-8 were scaled for bigger cabin diameters to provide the room.

Times have changed. After a second look at their standard-fare paying passengers, the airlines are back to the conventional four-abreast configuration. But with still fancier seats. And, of course, the extra space created by the bigger cabin diameters. American Airlines, again, is leading the way in establishing the pattern. When it launches its Boeing 707s on the Los Angeles-New York nonstop route in January, the seating configuration will be 56 and 56, with four-abreast seating in the first-class section, six-abreast in the coach. The new reasoning is sound. Jet flights will be of shorter duration. First-class seats would go begging if the passenger didn't get more comfort and more service for the higher fare.

• **Leased power**—Allison's agreement with American Airlines has two phases. One covers the leasing of the 501 engines for AA's Lockheed Electras. The other covers unit exchange. Latter means that any time the airline needs to replace an engine it simply beckons to Indianapolis and Allison ships out a complete unit. AA will have to carry a spare or two at strategic points on the system, but otherwise it will require no inventory of engines or engine parts. The five-year contract also gives AA the option of buying the engines should it wish to do so. The carrier, of course, will wish to do exactly that along about the time the engines approach their residual value.

• **Used planes**—We keep asking Douglas where it thinks it may be able to dispose of the 10 DC-7s it is taking in trade on United Air Lines' DC-8 purchase. All signs indicate there is no market for used DC-7s. But Douglas is unruffled. "We're not too sure they'll even come back to us," says Nat Paschall, Douglas v.p. of sales. Douglas is

—WEST COAST TALK—

highly optimistic of the airline future. The Douglas curves all point upward and show promise of continued gains in traffic. Douglas thinks UAL may very well find itself in need of the equipment. In fact, it will come as no surprise to Douglas if the airlines once again find themselves short of equipment along about 1962.

• **New aircraft**—The Torrance Municipal Airport, one of the busier personal-plane fields in the Los Angeles area, is also the scene of considerable development activity. Projects on the field include Transland's AG-2 agricultural applicator; Longren Aircraft's L-13 conversion called the Centaur (see page 43); Steward-Davis' C-82 conversion called the Jet Packet, and Doak Aircraft's ducted-fan VTOL. Doak has an Army development contract, but the others are all strictly commercial ventures involving risk capital.

• **Always taxes**—Douglas paid the State of California 4% use tax on its DC-8 test airplane and Lockheed laid it on the line for the house Electras used in its test and demonstration program . . . The extra 900 gallons of fuel, which could extend the range of the Lockheed Electra to 3,460 miles with two hours reserve, would go in the wheel wells . . . Bert Monesmith, general manager of Lockheed's California division, which produces the Electra aircraft, bought two Buick Electras.

• **Long route**—Douglas made its first offer of a 310,000-lb. DC-8 jetliner to Alitalia because its Rome-Caracas nonstop is as long as they come . . . Hiller is scheduled to fly its X-18 in January . . . AiResearch Aviation Service reports sales of "Maximizer Kits" for DC-3s in Africa, South America and Asia.

• **Quiet please**—Rohr Aircraft Corp., which is manufacturing the Boeing-designed noise suppressor and thrust reverser for the 707, has a unit of its own design under test, and thinks it may turn out real well. Rohr also has been selected to design and build a thrust-reverser for North American's F-100F . . . Ryan Aeronautical's all-jet VTOL X-13 weighs approximately 7,500 lbs. and has a thrust-to-weight ratio of 1.3:1.

AIRTRENDS

Appointment of E. R. "Pete" Quesada to be administrator of the new Federal Aviation Agency raises a number of questions.

Will likeable Jimmy Pyle, whose job as Administrator of the Civil Aeronautics Administration is being abolished January 1, be named Quesada's deputy at FAA? If so, will the CAA top staff move over to the FAA en masse?

What about Louis S. Rothschild, under-secretary of Commerce for Transportation, whose resignation takes effect October 24? His plans are uncertain, but he is expected to stay around Washington for the time being at least. And the President told him in a "Dear Louis" letter, accepting his resignation, that he appreciated his "offer to serve again in the future should the need occur."

Airlines are leaning toward group bargaining with pilots and other unions, although industry opinion isn't unanimous yet. ATA president Stuart G. Tipton's recent speech, critical of ALPA and government labor machinery, was a step in this direction (see page 36). It's no secret that group bargaining has been the subject of numerous industry discussions in recent months. If all carriers decide to go along—two or three are reported on the fence—group bargaining agreement will be filed with CAB.

Big engine leasing deal of American Airlines is now revealed to include 442 powerplants. Of these, 162 are Allison 501D turboprops for the 35 Lockheed Electras, 140 are General Electric CJ805-21 fanjets for 25 Convair 600s, and 140 are Pratt & Whitney JT3C-7s for 25 Boeing 707-023s. Value for leasing purposes of Allison engine is \$88,950, GE engine \$196,500, P&W \$153,750. AA will pay \$3,100,145 each for Boeing 707-023s, exclusive of engines and spares, \$3,171,814 each for Convair 600s on same basis. In addition to engines, AA will lease 150 Aeroproducts propellers, valued at \$23,600 each for leasing purposes, for its Electras.

Look for Pan American eventually to eliminate almost all Atlantic tourist service. Reason: popularity of economy class.

PAA's first jet schedules will provide a combination of the two extremes of service—extra-fare de luxe (32 seats) and economy (89 seats). Later flights may carry standard first-class and economy. PAA, incidentally, expects traffic to jump at least 25% next year, due to normal growth, attractiveness of jets, and diversion from nonjet operators.

What does James N. Juliana bring to the job of executive assistant to the chairman of the Civil Aeronautics Board? This is the question puzzling airline officials since the appointment was announced. Juliana, a former FBI agent and accountant, is said to be a very nice guy but he has had no aviation experience to speak of and his background in government administrative work is quite limited. His major task will be to help Chairman James Duffee try to get the other four members of the CAB to work together with less friction.

Airlines and Arinc have no intention of accepting without a fight the FCC ruling on frequencies for collision avoidance systems and Doppler radar. In an unprecedented action at presstime, Arinc, ATA, Bendix Aviation Corp. and three carriers (PAA, TWA and United) took their case to the U.S. Court of Appeals. Their stand: FCC action was illegal, invalid, defective and in violation of a formal U.S. treaty. Behind the scenes: virtually unanimous world-wide support for the airlines position. On the spot: FCC, for its apparent inability to administer the frequency program other than as a "rubber stamp" agency for Office of Defense Mobilization.

Newly-elected vice president-administration of Western Air Lines is Stanley Gewirtz, who has been vice president and assistant to the president of the Air Transport Association. Gewirtz will head a WAL division that includes labor relations, public relations, personnel, government affairs and schedules. Reshuffling at ATA will see Fred Davis, who has done a highly creditable job as director of the enforcement office, become assistant to the president. Frank Oelschlager, chief investigator, will be acting head of the enforcement office.

Summary of Official Air Force Investigation:

KC-135A Crash Near Westover AFB, Mass.

The Accident:

At approximately 0030 hours, Eastern Daylight Time (EDT), on 27 June 1958, a U.S. Air Force KC-135A Strato-Tanker, SN 56-3599A, crashed shortly after takeoff and was totally destroyed approximately 1 mile off the end of the departure runway at Westover Air Force Base, Chicopee Falls, Mass. Seven crew members and eight passengers were injured fatally.

History of Flight:

a. In compliance with competent orders, USAF KC-135A, SN 56-3599A, was scheduled for an early morning departure from Westover AFB, Massachusetts, on a trans-Atlantic flight on 27 June 1958. The aircraft, the third of four KC-135's for departure on the mission, was scheduled to fly non-stop from Westover AFB to London, England, thence to New York City, New York, and on to a mission termination destination at Friendship International Airport, Baltimore, Maryland. A fully qualified flight crew of seven was assigned and eight passengers were authorized to be aboard the aircraft.

b. All required flight crew and maintenance preflight inspections were completed satisfactorily during the evening of 26 June 1958. Thorough and comprehensive briefings on pertinent aspects of the mission were given to the flight crew and the eight passengers. This aircraft, as number three, and the one scheduled to follow were configured for higher departure gross weights than were the first two aircraft.

c. Since mission requirements called for the maximum permissible fuel load, surface air temperature and its effect upon aircraft takeoff performance provided a limiting factor. The aircraft had been serviced with fuel to provide an initial gross weight of approximately 289,000 pounds. Additional fuel was to be added if air temperature at takeoff time would permit. At 2200 hours, EDT, on 26 June 1958, takeoff prediction calculations were made. Using a forecast 67° Fahrenheit air temperature, a 30° flap setting, and a gross weight of 290,000 pounds, the expected takeoff ground roll distance was computed as 10,000 feet. By 2300 hours, EDT, 26 June 1958, it became apparent from air temperature readings taken on the departure runway that temperature at takeoff time might be as high as 70° to 72° Fahrenheit. The airborne mission commander and the aircraft commander of the KC-135, taking into consideration the higher than originally expected air temperature, reevaluated the takeoff performance calculations and

determined that use of an increased flap setting (40°) would provide a desired decrease in the distance required to enable the aircraft to become airborne. (The pilots of the first two aircraft had determined, and used successfully, a 30° flap setting for their lower gross weight takeoffs. The takeoff of the fourth aircraft, at approximately the same gross weight as 3599, was cancelled as the result of the accident.)

d. After engines were started at midnight on 26 June 1958, the aircraft was taxied to the takeoff runway, the crew completed satisfactorily all pretakeoff engine and equipment checks and the pilot received an Instrument Flight Rules air traffic clearance. In consideration of the higher air temperature, additional fuel had not been added and the gross aircraft weight at takeoff approximated 289,396 pounds. Takeoff power was applied and the aircraft started rolling on runway 23 at 0030 hours, EDT, 27 June 1958. The precomputed takeoff ground roll for the aircraft, with a 40° flap setting, was 9600 feet. Observers noted actual aircraft lift off after about 10,000 feet of ground roll. Weather conditions at the time of takeoff were reported as a broken layer of clouds at 700 feet, a 10,000 foot overcast, a visibility on the takeoff runway of 1½ miles in fog, a temperature of 71° Fahrenheit, and wind of 9 knots from 220°. There was no precipitation. From the distinct noise level of the engines during takeoff, it was obvious to competent witnesses that the aircraft engines were being supplied with water augmentation for maximum takeoff power and all four engines were apparently performing without difficulty. The takeoff appeared satisfactory to ground witness although with a noticeably flatter climbout angle than would be normal for this type of aircraft at a lesser gross weight. At a distance of 2100 feet from the end of the departure runway, the aircraft passed well clear of tree tops extending 26 feet above the runway elevation. At a point 4050 feet from the end of the runway, the aircraft fuselage, left wing and engines struck tree tops that were approximately 16 feet above the runway elevation. After an additional 700 feet, the aircraft, which up to this time had been in a wings level attitude, assumed a left bank of approximately 30° and again struck tree tops. The aircraft continued on, cutting through six commercial power cables, and struck the ground in a near vertical left bank. The aircraft was completely destroyed by ground fire and disintegration and fatal injuries were incurred by the crew of seven and the eight passengers. Between

the time the aircraft started its takeoff roll and the time of ground impact, no communication was received from the aircraft and the first indication that something was amiss was when observers noted the ground fire resulting from burning fuel.

Investigative Determinations:

a. The flight crew on this aircraft was fully qualified in the positions as assigned.

b. In consideration of the relatively high gross weight of the aircraft (as required by the mission), marginal weather conditions and darkness, this particular takeoff could not be considered as "routine." The use of a 40° flap setting which would and did act to decrease the takeoff ground roll distance required maximum performance from crew and aircraft. The penalty to be paid for a decreased ground roll would be a shallower climbout flight path. This penalty was known to the flight crew through their takeoff prediction calculations and was to be negated, as soon after takeoff as performance would permit, by retracting flap to a reduced extension setting.

c. It was determined conclusively that there was no structural failure, in-flight fire, engine malfunction or any failures within the fuel, hydraulic, or electrical systems prior to ground impact. Further, the loading of the aircraft and the resulting center of gravity was well within recommended limits.

d. The aircraft descent during the period that a climbout flight path should have been established is considered the result of complications in aircraft handling technique compounded by flight instrument limitations. In order to clear successfully all obstacles, the aircraft, with all its systems, and crew performance were required to be at near optimum. Since air speed is a primary consideration immediately after takeoff and with cognizance of the inherent normal errors in other flight instruments, it is considered likely that pilot concentration on the air speed instrument may well have lasted a sufficient length of time for the aircraft to assume an undetected and relatively slight (4°) descent angle. The magnitude of descent sufficient to cause contact with the trees was only approximately 60 feet as the aircraft traveled forward nearly 2000 feet from the point of highest altitude. The very short period of time from the point of becoming airborne until the first obstacle was struck by the aircraft precluded any flap retraction and final ground impact occurred with the flaps at their original 40° extension setting.

(Airports/Airways Airtrends was omitted at deadline to present this major aircraft accident report just released.)

Central's Cure for Last-Place Woes



Cut trunk competition
Increase frequency of service
Liberalize operating authority
Add some productive new routes
Delete certain unproductive stops

By Eric Bramley
 Chief News Editor

FORT WORTH—Central Airlines feels that the prescription above would cure most of its ills. Now it's trying to get it filled—at least in part.

Central, among the 13 local service airlines, is now in 13th place in most categories—passengers carried, load factor, etc. It receives some \$2.5 million a year in subsidy, gets about \$45,000 a year in service mail pay and takes in better than \$1.5 million in passenger revenue from its 3,487 route miles serving 33 communities in six states.

But this year, Central expects a traffic increase of more than 9%. And with certain additions and deletions, its officials feel strongly that the company can do substantially better.

For one thing, it needs stronger traffic centers. The officials point out that:

1. Of 52 U.S. cities that last year boarded over 20,000 local service passengers each, Central serves only three.
2. Of the 98 cities that boarded over 10,000 each, Central has seven.
3. Of 50 leading cities served exclusively by local lines, it serves only Fayetteville, Ark.—in 44th place, boarding 5,905 passengers last year.
4. Of 160 pairs of points served by locals that average over 200 passengers a month, it has two.

And if you add the passengers

boarded by Central in its 10 leading cities last year, the total is only 78,811. Pacific Air Lines boarded 74,000 out of its No. 1 city (San Francisco) alone, North Central 205,593 out of Chicago, Mohawk 114,551 out of New York, and Ozark 101,716 out of Chicago.

• **Competition from trunks**—Central says that trunkline competition also is a major factor in keeping down its loads. It has competition on such segments as Ft. Worth/Dallas to Oklahoma City, 190 miles; Kansas City-Wichita, 180 miles; Oklahoma City-Tulsa, 111 miles; Tulsa-Ft. Smith, 100 miles. And the trunks have the frequency to get the business. Among Central's stronger segments are Ft. Worth/Dallas to Ft. Smith, Ark.; Ft. Smith-St. Louis, and Little Rock-Ft. Smith, where there is either no competition or trunk frequency is low.

The company's present average length of hop is 81.9 miles, average passenger haul 196 miles, average fare \$12.43, per-mile passenger yield 6.8¢. Its hope is that with the introduction of turboprops and jets, the bigger lines will concentrate less on the shorter hops in its territory.

Central is not a "two roundtrips a day" airline. Its route-mile turnover is 2.83 (the figure two equals one round-trip), which is less than two roundtrips daily over each segment. The

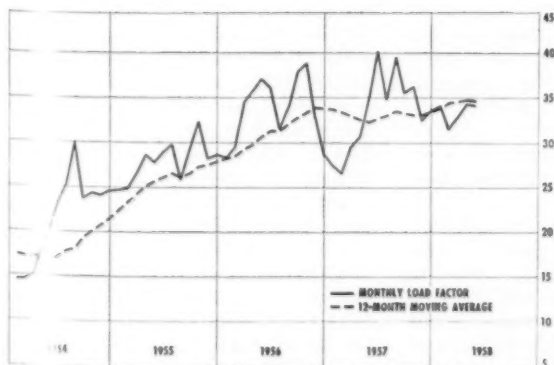
average of the local service lines operating only DC-3s is 5.14, with one as high as 8.22.

Keith Kahle, now president, was the organizer of Central in 1944. An aviation writer and enthusiast, Kahle persisted in his efforts to secure a CAB certificate and was successful in 1946. However, it was not until Sept. 15, 1949, that he was able to secure sufficient capital to start scheduled operations out of Oklahoma City with Beech Bonanzas. Headquarters were moved later to Meacham Field, Ft. Worth. Conversion to DC-3s started in 1950 and was completed in 1951.

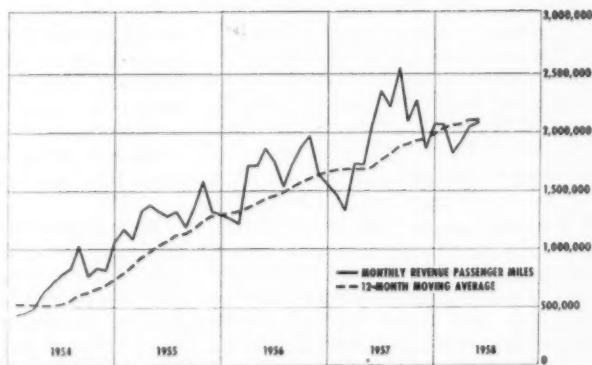
• **New routes the key**—At present, Kahle attaches great importance to CAB's pending Kansas-Oklahoma Local Service Case. Routes involved in this case, he believes, could give Central more of the productive mileage it needs.

The company has applied for 3,100 route-miles, which would almost double its total. Principally it wants Tulsa-St. Louis, Kansas City-Denver and Kansas City-Memphis routes, via intermediates. It claims that while the routes sought would triple its operating costs, they would quadruple its revenues. Break-even need per revenue mile flown would drop from 76¢ to 39¢.

Central currently operates with 14 DC-3s (11 owned and three leased from the Navy at \$2,000 a month each). Utilization is 5 hrs. 25 min. a day. Engine overhaul (at 1,200 hrs. on the Pratt & Whitney 1830s) is handled by Dallas Airmotive and Dallas Aero Service. Airframe overhaul, when due, will also be farmed out. Instruments are overhauled by Airline Instrument Repair, at Meacham Field, Ft. Worth. Central handles its own



CENTRAL'S LOAD FACTOR has progressed since 1954.



REVENUE PASSENGER MILES have shown steady growth.



CENTRAL AIRLINES OFFICIALS, discussing the Kansas-Oklahoma Local Service Case in which the company has extensive applications, are (left to right): Keith Kahle, president; R. L. Wageneck, vice president-operations, and F. E. "Pete" Howe, executive president and treasurer.

engine buildup, line maintenance and radio and hydraulics overhaul.

Because its schedule frequency is so low, Central cannot at present justify basing mechanics in the field, and most turnaround maintenance is done by fixed base operators or other airlines, R. L. Wageneck, vice president-operations, says.

Next summer, Central will move its headquarters from Meacham to Amon Carter Field in Ft. Worth, where it will lease a \$1.8 million office building and hangar.

One of the principal advantages of the move will be the elimination of aircraft ferrying expense. At present, although its base is at Meacham, Central originates no schedules there. Ferrying airplanes to Amon Carter Field to start flights costs \$60,000 a year, not including unscheduled ferryings.

Central estimated that it will carry 127,515 passengers in 1958, up 9% from 116,987 last year. However, Al Aldridge, vice president-traffic and sales, says the estimate was made before Kansas City-Topeka-Wichita service opened in June, and that the increase will be higher than forecast. In the first six months, traffic was up better than 18%, from 52,645 passengers last year to 62,428.

• **Wait and see with DC-3**—As far as replacing its DC-3s is concerned, the company has looked at the F-27, Convair and others, but its officials frankly say they don't know the answer. A plane with double the capacity would have to carry double the loads to maintain the present load factor, and Cen-

tral's question is: Would the airplane generate this on its own?

Like other locals, Central is anxious to justify the faith that its stockholders have shown in it. F. E. "Pete" Howe, executive vice president and treasurer, says these stockholders to date have invested \$684,737 in the airline and that after nine years the company's deficit is in the neighborhood of \$300,000. "These stockholders," he adds, "naturally want to see results." The people at Central think that eventually these results will be forthcoming, and they're hoping to hurry the day by getting their system in better order.

Fairchild Increases Prices Of F-27 and F-27A

Fairchild Engine & Airplane Corp. has increased prices of its F-27 and F-27A turboprop transports effective Nov. 30 because of increased labor and materials costs.

Base price of the F-27, powered by two Rolls-Royce RDa6 engines, will be increased to \$635,000 from \$590,000, and the F-27A, equipped with RDa7 Darts, will be \$695,000, or an increase of \$35,000.

Current prices were set in November 1956 and became effective Feb. 15, 1957.

R. J. Pfeiffer, vice president-marketing, said the advance notice of the price increase was made "in order to give buyers, now in the final stages of airplane evaluation and financing, the opportunity to place orders at the current price." He said production delivery positions are available starting in March.

Labor 'Imbalance'?

ATA head says ALPA has too much bargaining power

For the first time, the airlines have criticized the wage demands of pilots and the government machinery for the settlement of labor disputes.

Speaking for the airlines, Air Transport Association president Stuart G. Tipton told the Boston Rotary Club that there is an "imbalance" at the bargaining table in favor of the Air Line Pilots Association and that this enables the union to keep the airlines on a "constant merry-go-round."

On one side of the table, he said, are the airlines, "tightly regulated by the federal government." The carriers cannot increase, reduce, adjust or even discuss fares without government approval, he added.

Discussing the other side of the bargaining table, he said: "If you have an economically and politically powerful union that is able to operate under advantageous federal laws without the same responsibilities that are imposed upon the companies by the federal government, then you would have, it seems to me, a definite imbalance. Such an imbalance exists today in the airline industry."

"The airline pilots, for example, belong to a labor organization, national in scope and subject to relatively few legal restraints. Its economic strength stems from the fact that it has a strike benefit plan that is so liberal, compared to other unions, that it could well be considered unique . . . Perhaps because of this generous strike benefit plan, the strike threat has become commonplace in negotiations with each airline . . . ALPA . . . employs the strike threat at least once during virtually every negotiation of a contract . . ."

Tipton said pilots constitute less than 10% of the airlines' work force but receive over 20% of the payroll. Pilot salaries over \$20,000 were not uncommon last year and a few were over \$25,000, "more than even the Secretary of Labor." Estimated average for captains who flew as captains throughout the 12 months of the year was \$17,718 for domestic trunks, \$22,288 internationally. ALPA is asking as much as \$45,000 for pilots flying jets, he said, adding that a recent survey found that the American family doctor only nets about \$15,000 a year.

A pilot out on strike, Tipton stated, may get as much as \$650 a month in strike benefit pay, whereas the average for other unions that pay flat sum strike benefits is \$66 a month.

The Railway Labor Act, which in-

cludes airlines, is administered by the National Mediation Board, he said explaining that the procedure calls for negotiation by the parties, then mediation, then an offer of arbitration, and finally appointment of a Presidential Emergency Board if a strike threatens to disrupt commerce.

"In actual practice, however, negotiations tend to be merely exploratory. Mediation is a customary second stage and . . . strike threats are commonplace. The unrestrained union can utilize each step to its advantage.

"The . . . Mediation Board . . . must recognize this imbalance. While the Board's powers are limited, nevertheless, in exercising those powers it not only has the responsibility to aid in the making of new agreements but also in the maintaining of existing agreements."

Tipton said the 1934 Decision 83 of the old National Labor Board is "outmoded." This decision "provides a floor on rates that must be paid to pilots. It also perpetuates pay factors and working time limitations based on a period when relatively primitive flying conditions prevailed and pilots were deemed to have but a short productive life in the air." Today, he asserted, a pilot's productive life is not less than that for the average professional man, and pilots have the same insurance premium as applies to house painters. One airline found that 80% of the pilots employed by it in 1937 are still on the payroll, and six of them are over 60 years old. Many pilots who will fly jets will be between 40 and 55, he said.

"The total impact of all of these factors, that is, the union's ability to utilize collective bargaining machinery to their advantage, continued recognition of the archaic principles of Decision 83, and the great economic power of ALPA, is such as to keep the airline industry on a constant merry-go-round. For example, between 15 and 20 airlines at a given time are involved in one phase or another of negotiations by ALPA. Between now and the end of 1959, 21 existing contracts will expire and have to be renegotiated . . .

"There must be an intelligent and imaginative effort to square government policies with the heavy responsibilities that are imposed on scheduled air transport. This same effort must be made by organized labor. Imbalance in the labor-management area can only damage our progress."

Tipton concluded that if the U.S. is to reap the full benefits of the jet age, there must be a "new awareness on the part of government agencies at all levels" of the heavy responsibilities imposed on air transport.

... Transport Aviation News in Brief

• **Engine leasing and exchange**—Allison Corp. has been formed by Allison Division of General Motors to finance powerplant leasing and unit exchange agreement for the Allison 501 turbo-prop engines for American Airlines' Electras. Under unit exchange provisions, Allison will overhaul both engines and accessories, but will farm out the latter work to the accessory manufacturer or companies engaged in this work. If Allison enters engine leasing agreements with other airlines, separate corporations will be formed.

• **Airlines accept Board findings**—Six airlines involved in a longterm dispute with the International Association of Machinists have accepted the recommendations of a Presidential Emergency Board, but the union is still showing some reluctance to go along. Thus far, general chairmen of the six union locals involved have indicated willingness to resume negotiations, but that's about all. Airlines involved are Eastern, Capital, Northeast, Northwest, National and TWA. Board recommended retroactive pay increases and two-year contract extending to Oct. 1, 1959.

• **Stratocruisers sold**—Transocean Air Lines bought four of the 14 Boeing Stratocruisers returned to the manufacturer by BOAC as part of the deal under which the British airline will buy 15 Boeing 707s. The Babb Co., appointed by Boeing to dispose of the 14 planes, handled the transaction.

• **Convair 240s purchased**—Frederick B. Ayer & Associates, New York, will buy 24 Convair 240s from American Airlines for resale and lease. Sale of the planes, valued by Ayer at \$6 million, is a step in AA's jet conversion program. Ayer plans to sell the 240s for \$250,000 each in 40-seat airline versions, and for \$385,000 in executive versions (fuel capacity increased from 1,000 to 1,500 gallons to increase range by 50%). AA will complete delivery to Ayer by Jan. 1, 1960. AirResearch Aviation Service Co., Los Angeles, will handle the executive conversions for Ayer.

• **Longer range for Electras**—Lockheed Electras ordered by Northwest Airlines will have fuel capacity increased by about 900 gallons to make them non-stop transcontinental aircraft, NWA president D. W. Nyrop said. NWA is the first carrier to order the modification, he added. The company has 10

Electras on order and two optioned, plus five Douglas DC-8s ordered and four optioned.

• **707 route set**—Pan American World Airways said it will start transatlantic service with Boeing 707 jets Oct. 26 with daily flights from New York to Paris and Rome. London flights will begin Nov. 16. Eastbound New York-London flying time will be six hrs. 35 mins., New York-Paris, seven hrs. Meanwhile, Italian authorities said they would refuse to allow the jet to use Ciampino airport, 12 miles from Rome, because of inadequate facilities at the field.

• **EAL asks investigation of PAA-NAL merger**—Eastern Air Lines asked CAB to start an immediate investigation into the proposed stock exchange and jet equipment lease agreements filed with the Board by Pan American World Airways and National Airlines (A/A, Sept. 22 p. 58). It also asked that the carriers be required to preserve the status quo until the Board can consider the agreement after hearing. EAL charged that the agreements would result in PAA controlling NAL and that PAA "would effectively be substituted for National as the operator of the National Airlines system and the important Florida-Northeastern United States route."

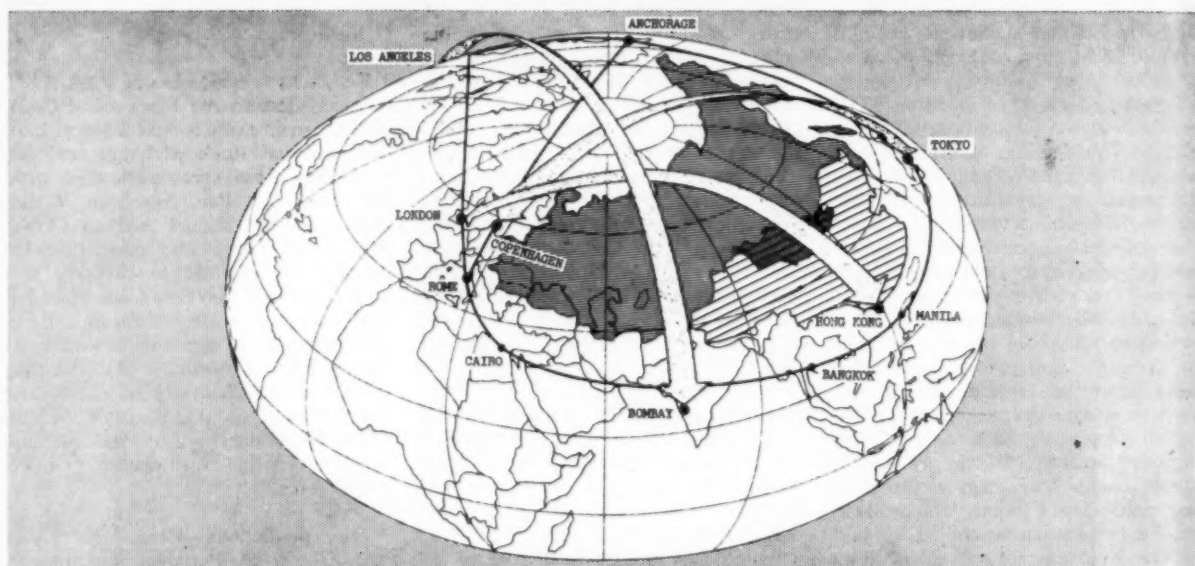
• **Dire predictions**—United Air Lines president W. A. Patterson said that, as a result of CAB decisions that have created "excessive competition," the airlines face a "serious day of reckoning," probably in 1961-62, and that bankruptcies or mergers are going to result in fewer carriers. Small lines will be forced to buy jets in order to compete and some may not be able to survive without heavy subsidy, he said, adding: "However, when the facts are known as to the cause of this difficulty, I doubt that Congress will be willing to re-enter subsidy on any substantial scale . . . It will not be long before (CAB) must face the facts that are now coming to the surface."

• **Jet inroad on railroads**—An Interstate Commerce Commission examiner said the railroads' share of the travel market "seems to shrink when the new jet transports . . . are placed in service." The study predicted the demise of rail passenger coach service, except for commuter service, by 1970 if the present decline in passengers continues.



Sovfoto

Despite the antiquated interiors of earlier Russian transport aircraft . . .



Aeroflot is laying plans to girdle the globe with its new jets.

Red Airline Wages Economic Warfare

By Robert Burkhardt
Transport Editor

"We declare war on you in the peaceful field of trade," Soviet Premier Khrushchev announced recently.

Like many a declaration of war of late, this one came somewhat after the fact. More than two years ago the Red Air Force had its battle orders. First attack would be by air, and it began this past summer.

Spearheading their economic blitzkrieg is Aeroflot, the civil air transport arm of the Soviet Air Force. Using their ultra-modern new jets and turbo-prop aircraft, Aeroflot started service this year to a number of major free world capitals: New Delhi, Brussels, Copenhagen, Paris.

In a few more weeks the Russians will start operations on the Moscow-London route.

Let there be no mistake about it. Soviet diplomats have scored a series of major successes in obtaining traffic rights for Aeroflot in country after country that has as little reason to trust the Reds as we do.

• **Economic "aggression"**—The pattern of Soviet economic aggression becomes more clear with each new step. They have been successful in trading minor concessions, such as the right to fly to Moscow, pick up such traffic as may be there, and return, for major Western rights, such as the right to fly over and beyond a country. Complex diplomatic horse-trading is neces-

sary because the maritime doctrine of freedom of the seas and open ports does not apply to the skies.

Indeed, the Red Air Force itself is quick to force down any foreign aircraft that crosses its borders. Since the USSR sits astride a number of vital great circle routes (see map above), such as London-Tokyo and Los Angeles-Bombay, the right to overfly Soviet-controlled territory is a valuable one and will be a key bargaining point in future negotiations.

Until now the U.S. has been a comparatively soft touch in the international give-and-take of bilateral negotiations. Our Civil Aeronautics Board and State Department have been generous to a fault in giving away traffic rights both to our former allies, such

as the Dutch and the French, and to our former enemies, the Germans and the Japanese.

Until the Reds started their economic offensive, there was nothing we could give them because they wanted nothing. They had no four-engine equipment but, even if they had had some, so long as Stalin was alive not a single foreign commercial flight was ever allowed to enter the Soviet air space, not even flights operated by Russia's own satellites.

• **Dramatic change in policy**—Now the policy has changed most dramatically. First step was to develop new and economically attractive aircraft.

In an annual review published earlier this year in the Soviet magazine "Civil Aviation," Chief Air Marshal P. F. Zhigarev—top-ranking Red Air Force officer in charge of Aeroflot—said that "bolder and speedier turbojet and turboprop airliners will soon be put into service." In recent months, the Marshal boasted, Aeroflot introduced five new turbine-powered aircraft: the Tu-104A, Tu-110, Il-18 and An-10 transports and the 120-passenger Mi-6 helicopter.

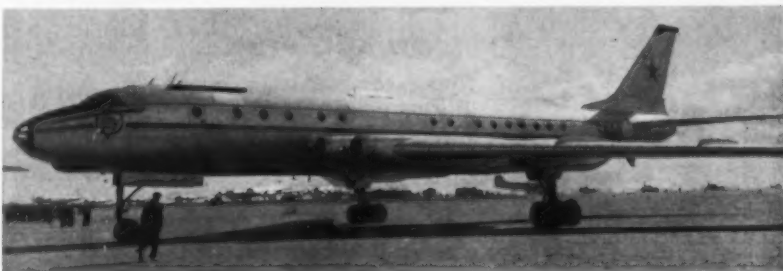
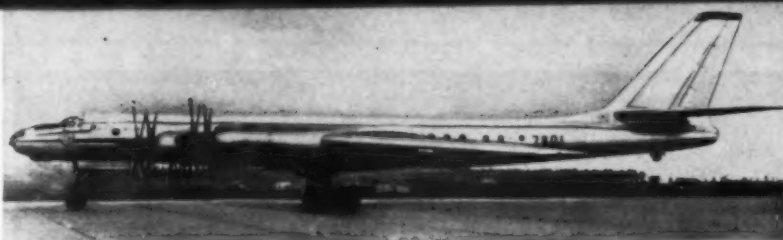
Right at the moment, the TU-114 a four-engine turboprop designed to carry up to 170 passengers in pressurized comfort—is Marshal Zhigarev's pet.

• **Soviet diplomats' assignment**—To strike as hard as possible at the West, these planes must be flown along a global network of routes. This is a job of the Soviet diplomats. They must give as little as possible in the way of rights to the USSR or across their country. But whether they give a little or a lot, their job is to gain access to all the important cities of the free world for Aeroflot.

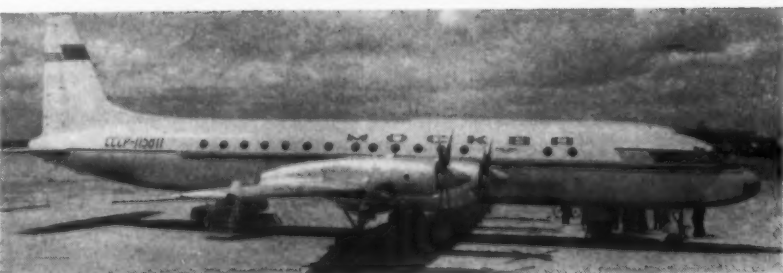
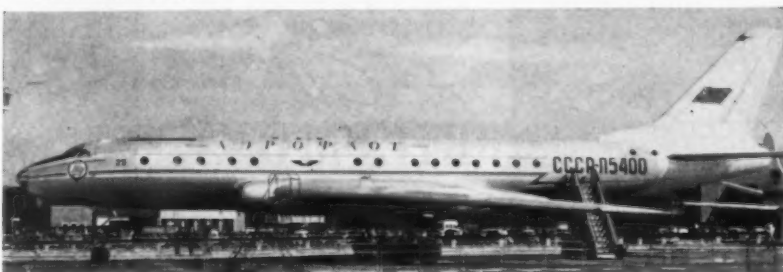
Yet Aeroflot has no need to be worried about load factors or whether IATA is going to crack down if economy-class passengers are given some trifling touch of luxury. Any operating deficit—if Aeroflot bothers to keep books at all—will be no more than a small item in the budget of the Red Air Force.

But Khrushchev wasn't just making talk with his declaration of economic warfare. The threat is a real one.

SOME OF THE AIRCRAFT on which Aeroflot pins its hopes: Top, the Tu-114, a 170-passenger turboprop; others, in order, are the 100-passenger Tu-110; the Tu-104; the Ukraina and the Il-18. Bottom, four-engined turboprops, and the 120-passenger Mi-6 helicopter.



Fotokhronika Tass



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Magnificent throughout: in its 320 restful air conditioned rooms; in the dramatic setting of Café International, featuring superb international cuisine; in the intimate, cheerful Flight Bar lounge.



This junket was staged by the Airways Modernization Board to announce the start of an AMB sponsored, in-service evaluation of hyperbolic navigation systems for helicopters.

• **AMB is very cagey**—AMB was careful to point out that this program was not an endorsement of Bendix-Decca over any other system. Said AMB: "The objective is to determine to what extent a hyperbolic system will expedite helicopter operations in a high-density terminal area."

Under contract to the AMB, Bendix-Decca has installed a Decca chain of transmitters in the New York area. Receivers have been installed in each of New York Airways' five Vertol helicopters and one specially instrumented Bell helicopter belonging to the AMB. New York Airways has contracted with AMB to fly the equipment on all scheduled flights for a six-month period.

• **Helicopter requirements peculiar**—New York Airways has worked behind the scenes a long time to get this recognition of the special navigational needs of helicopters. Certainly the murky weather emphasized the peculiar requirements of the whirlybirds: precise flight on curving tracks with instant and accurate knowledge of position—a picture, no mental gymnastics. No chart-stumbling. No knob-twisting.

AMB wanted it made clear that it was not considering Decca as a "short distance navigation aid." "Vortac is good for that." But the little green pin made this old DC-7 pilot drool a little. Getting ready to depart westbound from Idlewild is a little like getting ready for the potato race at a Sunday School picnic. You get all the charts and frequencies lined up ahead of time—and then you hope to be able to both read the charts and twist the knobs fast enough to get over Syosset to the Bay Intersection ahead of the airplane.

• **Stiff competition ahead**—Bendix would like Decca to take roots in our soil and grow into a thing of green paper beauty. But there will be stiff competition. For example, Doppler, self-contained navigation system in the same sort of position, will work behind buildings, and could be made to drive a green pin across the chart to Timbuktu if necessary.

Some answers are likely to come when the Airborne Instrument Laboratory (also under contract to AMB), comes forth with the technical data gathered by the New York Airways' Vertols for AMB analysis.

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SIDELIGHTS

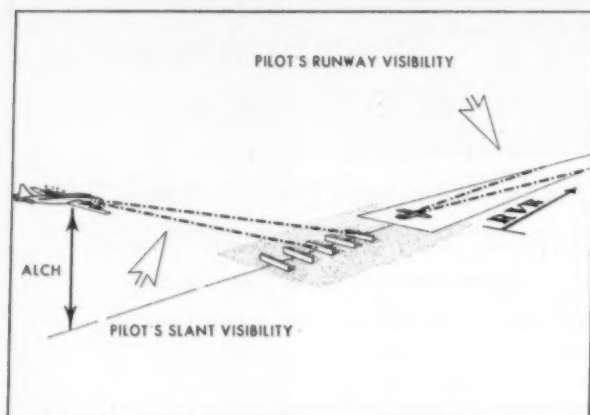
• **Toss a coin**—Just to show how confusing life has become, an airplane in Ohio in landing hit and damaged a cow. Nothing has as yet been done about it because no one can decide whether it is a matter for the CAA or the Department of Agriculture.

• **In the family**—When the Leach Corp. promoted R. L. (Dick) Adams to administrative engineer of its relay division, he was succeeded as chief development engineer by his brother A. O. (Andy) Adams.

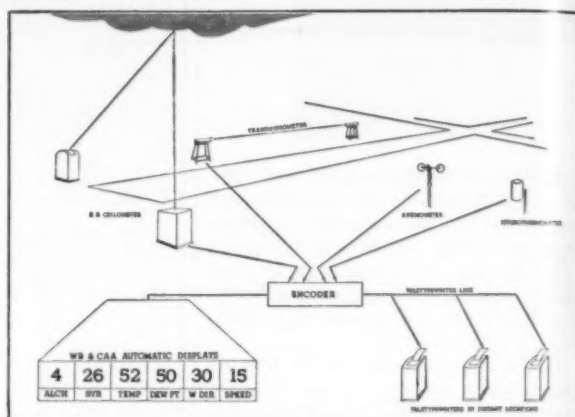
• **Licensed advertising?**—Charlie Candee, who works for Northeast Airlines at Burlington, Vt., has an appropriate 1958 Vermont license plate on his car. It's FLY. Beneath it, naturally, he has attached a Northeast Airlines sign, making his car a rolling advertisement.

• **Traveling man's impressions**—Northwest Airlines' "most traveled" man is Frank Naughton, the company's traveling auditor. Last year he was on the road for 191 working days, flew the equivalent of more than four times around the world. His comments on the NWA system: best route segment is the DC-3 flight between Billings, Mont., and Seattle, more particularly the Kalispell, Mont.-Spokane segment on a clear day. Best terminal Anchorage—never crowded, ticket counters close to loading gates and near bar, restaurant and gift shop. Most expensive town: tossup between New York and Chicago. Most inexpensive town: Billings. Best spot for a two or three-day vacation: Washington, D.C. Best large city on the system: Milwaukee, which is cosmopolitan but hasn't yet lost its provincial air." Best small city: Yakima, Wash.—"clean, good climate, little commercialism."

AIRPORTS & HELIPORTS



APPROACH LIGHT CONTACT HEIGHT tells pilot altitude at which he should see 500 ft. of lights on final approach.



END OF RUNWAY INSTALLATION. Runway visual range and ceilometer combine to give approach light contact height.

The Weather Bureau's Five-Year Plan

U.S. Weather Bureau, under a semi-crash program to meet demands of growing civil traffic and imminent jet operations, is moving ahead with a five-year program to modernize its aeronautical weather services.

Although Congress voted the Bureau an extra \$1 million in funds in fiscal 1959 to get the program under way, first major fund request to support the estimated \$80-\$100-million project is expected in fiscal 1960.

According to N. A. Lieurance, Director of Aviation Services, and Dale Harris, Chief of Aero Meteorological Investigations, the plan covers the following areas:

- **Terminal Forecasting.** Plans call for automatic cloud height and runway visibility equipment at all ILS airports. This equipment is to be located near the center of the runway complex for greater accuracy. Also, completely automatic stations, reporting information in punched card form, are planned for all observing locations. Forecasting phase calls for advance information to aid operational decisions such as descents from altitude and traffic control in the terminal area. Detailed reports of slant range visibility trends will be prepared for planning of landing sequences.

- **En Route Weather.** In the observing phase, it is planned to offer more accurate data in the 20,000-40,000-ft. regime where the jets will operate. Pictorial charts forecasting wind and weather at selected altitude between 20,000 and 40,000 ft. will be provided user groups.

- **Weather Information Dissemination.** To cut down the number of indi-

vidual pilot briefings now required, broadcasts, automatic telephone answering, visual displays, and closed circuit television will be utilized.

- **Aviation Weather Network.** Installation of more airport weather stations is planned for aid in observation and dissemination.

- **Research and Development.** Aimed at improving forecast accuracy, production of upper air data through use of electronic computers is being developed. For observing and reporting, a single system is being developed which can automatically do what now requires the

effort of a trained observer. A new radiosonde balloon, GMD-2, is on the way. The GMD-2 can relay its position in time and space, unlike other balloons which have difficulty getting accurate wind data at high altitudes.

Most of the necessary hardware for these projects already exists. Thirty-five end-of-runway units, such as the one shown here, costing between \$15,000 and \$20,000 each, are in service, with funds available for a total of 111. Crouse-Hinds, Syracuse, N.Y., manufactures the Ceilometer and Transmissometer equipment.

... Airports & Heliports News Briefs

- **Remmert-Werner, Inc.** has begun metered helicopter taxi (HeliCab) service at St. Louis' Lambert Field, plans to introduce similar service at its general aviation operations in Toledo, Ohio, and Pompano Beach, Fla. HeliCabs are radio dispatched, have meters with punch cards that serve as combination receipt and invoice for passenger.

- **Avis Rent-A-Car-System** has announced plans to increase the size of its rental auto fleet in preparation for an anticipated larger demand expected to result from the introduction of the higher-capacity jet transports.

- **Second Jet Age Airport Conference** is scheduled to be held at the Shamrock-Hilton Hotel in Houston, Tex., May 20-22, 1959. Conference will be under joint sponsorship of the Air Transport Division of the American Society of Civil Engineers and the Houston, Tex. branch of ASCE.

- **To cope with the requirements** of the jet age, Paris is planning to spend \$86.5 million in the next two years on its two main airports—Orly Field and Le Bourget. Also under study is a plan to operate a helicopter service between the airport at Le Bourget and downtown Paris.

- **CAA is evaluating a plan** for the centralized coordination and handling of air traffic in high-density terminal areas. System was developed by Joseph J. Reino—a veteran traffic controller at Washington National Airport. As a result of Reino's plan, the CAA has assigned him to the project full-time. If successful, it will be incorporated into the CAA's traffic simulator at the technical development facility in Indianapolis for evaluation.

- **Delta Air Lines** is scheduled to begin work at Miami International Airport on a \$1.1 million cantilever-type hangar.



Longren to Market Centaur—L-13 Conversion

Longren Aircraft Co., Torrance, Calif. reports it will be ready to begin deliveries of its new Centaur aircraft early next year.

A conversion of the ex-military Convair L-13, the Centaur is designed to operate from small, unimproved fields. Nicknamed "the poor man's Beaver," the Centaur is said to carry from four to eight persons or up to 1,800 lbs. of cargo. Large cargo doors are provided for loading bulky items.

Priced at \$12,949, the new conversion retains the folding wings of the military model. This permits storage in a limited space and also makes it transportable by truck.

Engine is a 300-hp Lycoming R-680 and a 24-volt electrical systems permits the use of electronic and radio equipment.

Original plans called for the aircraft to be produced in Mexico but an assembly line for production models is being set up at the company's Torrance facility.

Centaur Specifications

Wing Span	40 ft. 5 in.
Length	31 ft. 9 in.
Height	8 ft. 5 in.
Weights	
Empty	2,300 lbs.
Payload (with pilot and 2½ hrs. fuel)	900 lbs.
Gross	3,550 lbs.
Max. speed	121 mph
Cruise speed	100 mph
Stall speed	46 mph
Initial rate of climb (Sea level)	750 fpm
Takeoff distance over 50 ft.	725 ft.
Landing distance over 50 ft.	700 ft.
Max. range	850 mi.

association with a company that has facilities for large-scale production.

Model II Specifications

Wing span	34 ft.
Wing area	190 sq. ft.
Length	22 ft. 9 in.
Height	7 ft. 6 in.
Empty weight	1,200 lbs.
Gross weight	2,100 lbs.
Maximum speed	135 mph+
Cruise speed	120 mph+
Landing speed	50-55 mph
Initial rate of climb	700 fpm+
Range (24 gals.)	300 mi.+

Business Flying Briefs

• **Piaggio P.166**, new land plane cousin of the P.136 Super Gull amphibian, received its U.S. type certificate July 31. Second prototype of the Italian twin-engine business plane is to be shipped to Trecker Aircraft Corp., Milwaukee, Wis. which (presumably) will introduce it to the U.S. market.

• **First executive version** of the Fairchild F-27 Friendship will go to General Tire & Rubber Co. Delivery is expected to be made this month.

• **Prototype Mooney Mark 22**, new twin-engine business aircraft, is expected to make its first flight shortly. Company is also adding a third model to its Mark 20 series, deliveries of which are slated for the latter part of this year. Designated Mark 20B, new model will be powered with a 250-hp Lycoming engine. Gross weight is upped to 2,750 lbs; cruise speed 200 mph and range 1,000 miles at 175 mph.

• **Joseph W. Frazer**, former president of Kaiser-Frazer Corp., and William R. Custer, inventor of the Custer channel wing for aircraft, have formed the Custer-Frazer Corp. to handle the manufacture and marketing of the Custer channel-wing aircraft throughout the world. Three planes have been built and flight-tested and a five-passenger, twin-engine experimental model has flown more than 100 hours.

• **Air Craft Marine Engineering Corp.** of Van Nuys, Calif. reports that purchase option agreements at a price of less than \$200,000 are being made on the the Model A-1 Anser, 6-place, twin-jet executive amphibian and that a production backlog is rapidly building up. Flight testing of the prototype is anticipated during 1959, with deliveries beginning at the rate of one a week in 1960. Company is planning to erect a new building near Van Nuys airport for manufacturing and assembly of production Ansters.



Aerocar Develops Four-Place Pusher; Seeks Facilities

Aerocar, Inc., Longview, Wash. has developed a non-roadable version of its "flying automobile" called the Model II Aero-Plane.

The new model retains the folding wings and general configuration of the roadable version but the cabin section has been redesigned to seat four persons and the landing gear has been changed to a tricycle configuration. With the elimination of many of the roadable version's components, coupled

with the extensive use of magnesium and Fiberglas, a saving in weight of about 360 lbs. has been achieved.

The Aero-Plane is built on the same jigs as the Aerocar and it is powered with a Lycoming O-320 engine derated to 143 hp, driving a ground-adjustable Hartzell propeller.

Price of the new model is \$12,500 FAF Longview. Plans call for quantity production of both versions. Molt Taylor, president of Aerocar, is seeking an



Everard M. Lester

Fairchild Engine Names Lester General Manager

Everard M. Lester has been appointed general manager of the Engine Division of the Fairchild Engine and Airplane Corp., at Deer Park, Long Island, N.Y.

He previously held the position of assistant general manager of the division and succeeds F. E. Newbold, Jr. who is now Fairchild vice president for planning. Lester has held a number of positions with the company. Prior to that he was with Pratt & Whitney for 13 years.



Marvin L. Davis

Continental Appoints Davis, Whelan VPs

Marvin L. Davis and Chris F. Whelan have been appointed vice presidents of Continental Air Lines, it was announced by Robert F. Six, president of the company.



Chris F. Whelan

Davis, who was formerly assistant vice president, sales, has been advanced to vice president, sales, for the airline.

Whelan fills the newly created post of vice president, economic planning-sales. He will be responsible for the economic planning of the company's jet program for 1959 when major routes of the Continental system will be operated with turbine-powered aircraft.

People on the move in Transport

John Young, Jr. has been elected chairman of the 1959 IATA Agency Committee, Western Hemisphere. He is agency and interline sales manager, North America, for Sabena Belgian World Airlines.

George A. Harris has been appointed director of purchasing division for American Airlines. He formerly was associated with the Ford Motor Co. Richard F. Gardiner has been named manager of management development in the airline's personnel department.

N. P. Cavett has been named as chief pilot for Pacific Northern Airlines, succeeding Maurice Keating, Jr. who has returned to scheduled flying duty.

El Al Israel Airlines has appointed Maurice Kouffman to the newly created position of regional operations manager for North America.

W. T. Waggoner, Jr. has been elected to the board of directors of Bonanza Air Lines.

. . . Manufacturing/Military

Henry M. Michaels, Jr. has been elected to the newly created position of executive vice president of Aircraft Radio Corp. He previously served in various capacities at Reaction Motors.

Pratt & Whitney Aircraft has announced the promotion of four sales executives. They are: John Craig, Jr., chief, military and commercial sales; Henry J. Remmer, chief, field engineering; Donald S. Conrad,

chief of sales operations, and Stanley M. Taylor, chief of commercial sales.

Colonel William E. Waibel has been appointed a vice president of M. Steinthal & Co., Inc., parachute manufacturer. Formerly assistant to the president, he will head the company's West Coast office.

W. C. Loeman, formerly manufacturing vice president, has been named president of Parker Aircraft Co., Los Angeles. He has been with Parker since 1947, rose from industrial engineer, production manager and general manager to presidency. R. W. Cornell transfers from Parker presidency to take over planning and marketing as vice president of parent corporation, Parker-Hannifin Corp., Cleveland.

A. V. Zukas has been named a vice president of Parker Aircraft Co. He will be responsible for contracts administration and product planning for the Los Angeles, Inglewood and Cleveland, Ohio operations.

Harvey D. Gunning has been named Dyna-Soar program manager for the Boeing Airplane Co. He will also assume the duties of acting technical director.

Daniel J. Houghton and Dudley E. Browne have been elected to the board of directors of Lockheed Aircraft Corp.

Houdaille Industries, Inc. has named H. L. Spencer to direct sales at the company's Buffalo Hydraulics Division and A. J. Frattianne as general manager at the Fairmount Tool & Forging Division. Company manufactures hydraulic devices for the aircraft industry.

Sikorsky Aircraft has appointed Leete P. Doty as assistant general manager. He formerly was associated with Pratt & Whitney Aircraft Division.

Hans M. Schiff has been appointed to the newly created post of operations manager at the Ryan Aeronautical Co. plant in Torrance, Calif.

E. M. Armstrong has been elected vice president in charge of customer relations at Coleman Engineering Co., Inc. He formerly was with Air Logistics Corp.

Dallas Jennings, of Esso Standard Oil Co., who helped pioneer uniform specifications and quality for aviation fuels and lubricants 30 years ago, has retired.

Warren R. Smith has been appointed general manager of the new Applied Science Division of Fairchild Engine & Airplane Corp.

Brig. Gen. Richard D. Meyer has assumed the duties of Deputy Chief of Transportation for Aviation, a newly established position on the staff of Maj. Gen. F. S. Besson, Jr., U.S. Army Chief of Transportation.

Marvin E. Waspe has been promoted to the position of plant manager of the Cincinnati division of Bendix Aviation Corp.

John H. Hunt has been elected a vice president of Stavid Engineering, Inc. He is also director of manufacturing for the company.

Harry H. Goode has been named technical director of the Systems Division of Bendix Aviation Corp. He formerly was professor of electrical engineering at the University of Michigan.

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Bustle and a Bounce Battle But New Stops Are Ticked Off

Any sane person who wants to get to Fresno, Calif., from Washington, would hop on a United Air Lines DC-7 to San Francisco and take a United Convair from there.

But as everyone knows, I don't qualify as sane when it comes to flying, especially when I'm trying to hit some new airports.

I was booked to make a luncheon speech at the American Association of Airport Executives in Fresno last May, so instead of going the easy way I took two days to get there and hit four new stops en route.

A Capital flight took me to Detroit where I was to make a fast connection with North Central's frequent local service from there to Chicago. The weather was soupy and Capital was a half hour late getting on the ground—traffic problems. W. Mountjoy, North Central's station manager, was waiting for me and I was relieved that NOR was late, too, so there wasn't a grand rush. As would happen, I landed at the extreme end of one long finger and NOR uses the extreme other end—must be about a mile apart.

A little behind schedule, NOR took off for Jackson and the weather began clearing before we got there. Then came Battle Creek and Kalamazoo, both new stops, and then South Bend and Chicago. Crew was Capt. E. F. Collin, 1st Officer T. Baum, and Stewardess P. Stubbe. (Wonder why airlines use initials instead of names for stewardesses?)

Even if NOR had been on time, I had a close connection with United's 643 for Omaha and Denver. As it turned out, the connection was almost too close. Warren F. Rowe, passenger relations agent for NOR, met me, dispatched my bag by jeep, and we literally ran all the way to the far end of United's loading area. Here was #643 with two engines going, waiting for me to dash on board. The door closed and off we went. A minute later and I'd have missed the connection but I couldn't have griped. Airlines ought to run on

time and a single stray passenger who's late should take the rap.

United, as usual, had good inflight service. That afternoon basket of fruit is not only attractive but welcome. In my case, doubly so. I hadn't had any lunch. (Wonder whatever happened to that steak luncheon on NOR?) At Omaha, where there was a 35-minute stop, I got soup and a hamburger in the coffee shop.

Flight Across Rockies

At Denver I was met by Bob Six, Continental's president; Stew Faulkner, who turns out the CO press releases, and Gerry Kitchen, of Frontier, and I had about an hour to chat before boarding a Frontier DC-3 for Grand Junction, by way of Gunnison and Montrose (all in Colorado). It was late afternoon and a magnificent flight cutting right across the Rockies. There was plenty of snow at higher elevations. Capt. Len Larson, 1st Officer Don Lockwood and Stewardess Marilyn Gibson gave me a swell flight which included some fine views of the famous Black Canyon.

Arriving at Grand Junction about dusk, I got a message that I was to drive in town to the Flame Room of the Caravan Cafe for dinner with Vern Carlson, the Frontier d.s.m., and his wife, Mary Jane, before leaving on a later flight for Vernal, Utah—the one new stop I was after—and Salt Lake City.

For a town of 26,000, Grand Junction can be proud of that Flame Room. Not only is it attractively fixed up in big-city style, but the steaks and roast beef are first-rate. Got in a lot of shop talk with Carlson and had a relaxing interlude after flying for so long, and then it was time to dash to the airport again.

The flight was already on the ground so I hopped on and off we went across that weird terrain toward Salt Lake. Crew was Capt. Sam Grande, who's been flying DC-3s for 18 years; 1st Officer Tex

Searle and Stewardess Marty Hicks. Capt. Grande gave me a good view of the Vernal airstrip. Outside of Flagstaff, Ariz., the only Frontier stops I've got to make now are on the northern segment en route to Bismarck, N.D., and the new routes recently authorized. To get to Vernal took a lot of traveling and I'm glad I've got that pin off my map.

It was midnight when we pulled into Salt Lake. I had a room lined up at Denman's Motel and Cafe a few miles from the field on U.S. #40, and I can recommend it highly as a convenient place to stop; it caters to airline people. Capt. Hall, a Frontier pilot on his day off, had been on board. He was checking his Avis car rental concessions he owns at several spots (the businesses these pilots own on the side!). He gave me a ride to the motel for a night's sleep.

Threat to Walk Works

Up next morning early I was due out on a United Convair for San Francisco via Ogden, Utah; Elko, Ely, Reno (all in Nevada) and Sacramento. Ely was the new stop I was after. Although Washington's United office had told me I was confirmed, and in fact I was ticketed, I was told now that I was confirmed only to Reno and the local agent tried every possible way to switch me to a nonstop. He told me I'd be bumped at Reno. I said I'd go that far on the local if I had to walk from Reno to San Francisco. I had come a long way to hit Ely and I wasn't going to be dissuaded.

The flight across the great Salt Lake and the desert, ranch country and mountains of Utah and Nevada was excellent. As an easterner I always get a thrill out of the wide open spaces of the West.

I really expected to be bounced at Reno, but although there were stand-bys who had to wait for another flight, nobody asked me to get off at Reno and I stuck to my one seat all the way through.

Guess I can't blame the local agents for considering me a nuisance, insisting on local flights when I can take nonstops, but the United people west of the Rockies can relax. (Once before I had a whale of an argument to keep on a local flight through Salinas, Calif.) I've completed the entire United system now with exception of Bellingham, Wash., and I don't think I'll cause any trouble on that one. In fact I've got a hunch my money will be most welcome on that one.

At San Francisco I had a bad moment when United couldn't find any record of my seat to Fresno which had been confirmed weeks before, but I guess that was due to the Reno business (it was good to see such a seat demand out that way). A considerate agent got me fixed up and I had a pleasant hop down that productive San Joaquin valley to Fresno, where I joined the airport gang at that fabulous huge place called Hacienda Motel. Really quite an establishment and very well run. And they tell me my luncheon speech wasn't too bad.



ON AN EARLIER FLIGHT with North Central, WWP poses at Minneapolis with Shirley Skarpness.



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